

HP Kayak XU &W PC Workstations

User's Guide

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User's Guide



Welcome to Your HP Kayak XU & XW PC Workstations

Congratulations on the purchase of your new Hewlett-Packard Kayak XU or XW PC Workstation. These high-performance PC Workstations are equipped with:

- One or two Pentium™ II processors, with 100 MHz bus support, in slots for easy processor upgrading.
- Intel 440BX AGPset optimized for Pentium II for concurrent transactions through the processor bus, AGP bus, PCI bus, and memory.
- Processor-integrated level-two cache for improved performance.
- 64 MB or 128 MB of 100 MHz SDRAM ECC (error correcting code) DIMM memory, upgradeable to 1GB.
- A high performance 2D graphics solution (XU models) or a state-of-the-art 3D graphics solution that supports OpenGL acceleration (XW models).
- HP MaxiLife for top reliability and maximized uptime, ensuring smooth and trouble-free functioning.
- An integrated Ultra ATA/33 controller on the PCI bus supporting the fastest IDE devices.
- An integrated UltraWide 16-bit SCSI controller on the PCI bus (data transfer rate of up to 40 MB per second) dedicated to internal hard disk drives (HDDs).
- An UltraWide 16-bit SCSI accessory board controller for external peripherals (data transfer rate of up to 40 MB per second) and 8-bit Ultra SCSI connectivity for internal devices (up to 20 MB per second).
- A RAID*port*™ connector for acceleration of Internal UltraWide 16-bit SCSI channel with one or two hard disks.
- A 32-bit PCI 10BT/100TX autosensing Ethernet LAN controller with remote power-on and wake-up capability.

- Seven mass storage shelves:
 - ☐ Five front-access shelves
 - ☐ Two internal shelves.
- Six slots for accessory boards:
 - ☐ One AGP (Accelerated Graphics Port) slot
 - ☐ Three 32-bit PCI (Peripheral Component Interconnect) slots
 - ☐ One 16-bit ISA (Industry Standard Architecture) slot
 - ☐ One combination ISA or PCI slot.
- A CD-ROM drive.
- An integrated 16-bit full duplex high fidelity audio interface.
- An HP enhanced keyboard.
- For XU models — an HP enhanced mouse with scroll wheel that enables you to scroll without using the scroll bars.
For XW models — an HP enhanced 3-button mouse with added functionality when used with certain Windows NT applications
- A stereo headset with microphone.
- Headphone and microphone jack on the front panel.
- An HP UltraFlow cooling system with multiple temperature-regulated fans to optimize cooling.
- MIDI/Joystick interface connector (dual channel), audio Microphone IN jack, audio LINE IN jack, and audio LINE OUT jack on the rear panel.
- One parallel port, two USB connections, two mini DIN connectors (keyboard and mouse), and two serial ports on the rear panel.
- System BIOS and Video BIOS stored in Flash ROMs (for easy upgrading).
- BIOS support for ISA “Plug and Play” accessory board configuration.

NOTE

The Pentium™ II processor installed in your HP Kayak XU or XW PC Workstation provides the best performance when used with 32-bit operating systems and applications.

Who This Manual Is For

This manual is for anyone who wants to:

- Set up the PC Workstation for the first time.
- Configure the PC Workstation.
- Add accessories to the PC Workstation.
- Troubleshoot problems on the PC Workstation.
- Find out where to get more information and support.

Important Safety Information

WARNING

If you have any doubt that you can lift the PC Workstation or display safely, do not try to move it without help.

For your safety, always connect the equipment to a grounded wall outlet. Always use a power cord with a properly grounded plug, such as the one provided with this equipment, or one in compliance with your national regulations. This PC Workstation is disconnected from the power by removing the power cord from the power outlet. This means the PC Workstation must be located close to a power outlet that is easily accessible.

For your safety, never remove the PC Workstation's cover without first removing the power cord from the power outlet, and any connection to a telecommunications network. Always replace the cover on the PC Workstation before switching it on again.

To avoid electric shock, do not open the power supply. There are no user-serviceable parts inside.

This HP PC Workstation is a class 1 laser product. Do not attempt to make any adjustment to the laser units.

WARNING

There is a danger of explosion if the battery is incorrectly installed. For your safety, never attempt to recharge, disassemble, or burn the old battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. The battery is a lithium battery which does not contain heavy metals; nevertheless, in order to protect the environment, do not dispose of the batteries in household waste. Please return used batteries to the shop from which you bought them, to the dealer from whom you purchased the PC, or to Hewlett Packard, so that they can either be recycled or disposed of in an environmentally sound way. Returned used batteries will be accepted free of charge.

Important Ergonomic Information

It is strongly recommended that you read the ergonomic information before using your PC Workstation. If you are using Windows NT 4.0, open the Start menu in the task bar and select Help. Then double-click the help topic "Working in Comfort".



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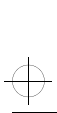
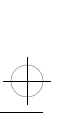
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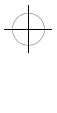
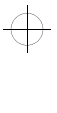
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1

Setting Up and Using Your PC Workstation

1 Setting Up and Using Your PC Workstation
Unpacking Your PC Workstation

Unpacking Your PC Workstation

WARNING

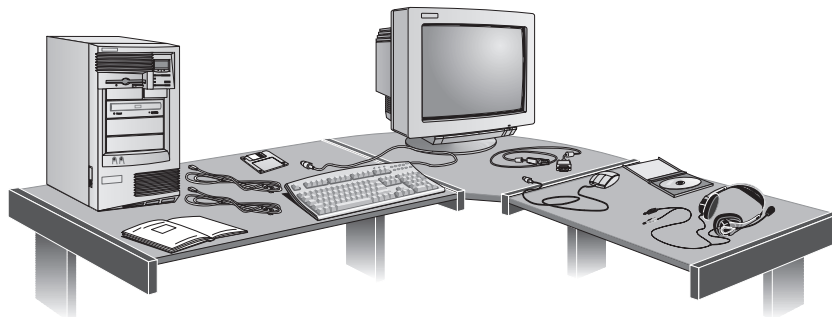
If you are in any doubt that you can lift the PC Workstation and the display safely, do not try to move them without help.

- 1 When you receive your PC Workstation, unpack all of the components:
 - Computer and power cords
 - Display and its video cable
 - HP enhanced keyboard, mouse, and headphones
 - Manuals and driver kit.

NOTE

Device drivers, HP utilities, and an online Network Administrator Guide are preloaded on your system and provided in a driver kit.

- 2 Place the PC Workstation on (or under) a sturdy desk with easily accessible power outlets and enough space for the keyboard, mouse, and any other accessories.



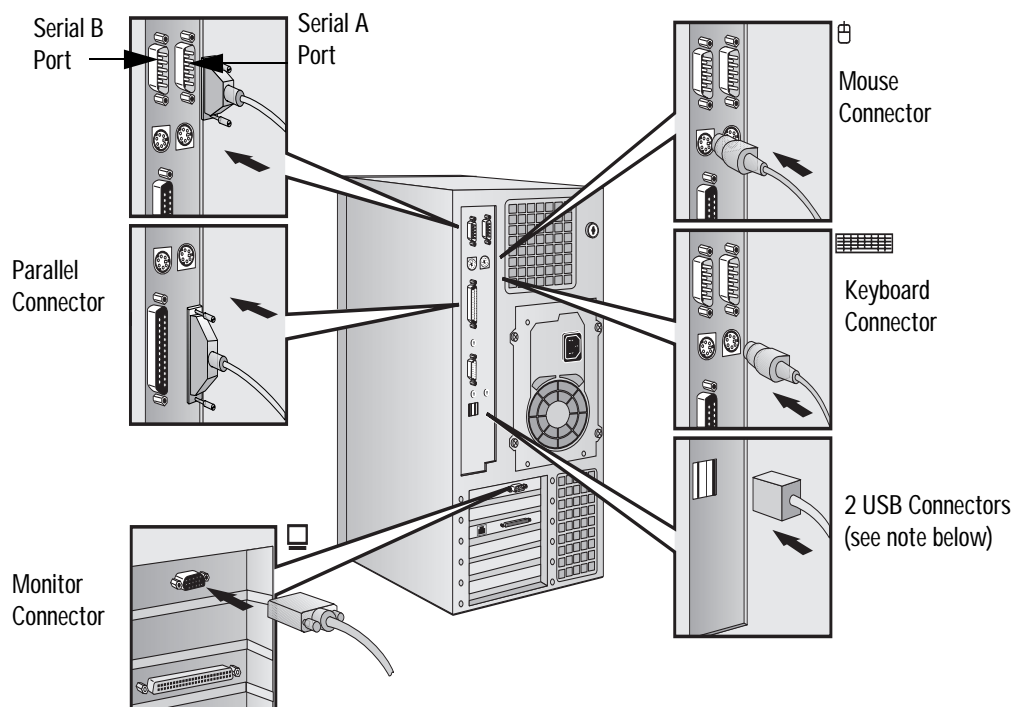
- 3 Position the PC Workstation so that its rear connectors are easily accessible.
- 4 Place the display next to the computer.

Installation Tools

No tools are required to install your PC Workstation. However, if you plan to install a disk drive or an accessory board inside your PC Workstation, you will need a flat-blade screwdriver. For more information on installing accessories, refer to "How to Install Accessories Inside Your PC Workstation", on page 23.

Connecting the Mouse, Keyboard, Display and Printer

Connect the mouse, keyboard, and display to the back of the PC workstation. *The connectors are shaped to go in one way only.* Tighten the display cable attachment screws.



Connect the printer cable to the back of the computer and tighten the attachment screws. Use the connector labeled:

- Parallel (25-pin parallel connector) for a parallel device.
- Serial A (9-pin serial connector) for a serial device.
- Serial B (9-pin serial connector) for a second serial device.

NOTE

The Universal Serial Bus (USB) connectors can be used for USB accessories. Most USB accessories are automatically configured as soon as they are physically attached to the PC Workstation. USB accessories are not supported by all operating systems.

1 Setting Up and Using Your PC Workstation

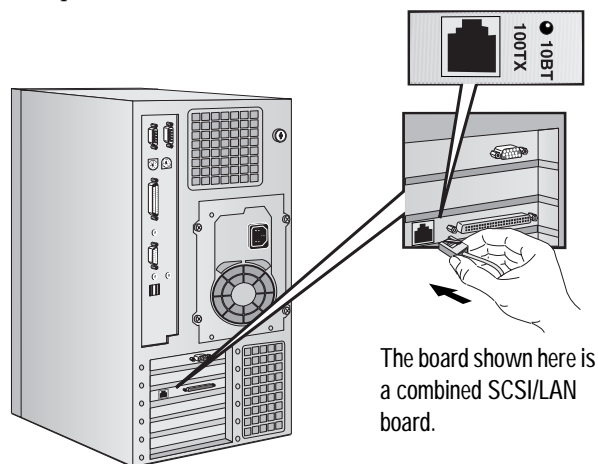
Connecting to a Network

Connecting to a Network

Your PC Workstation has a 10BT/100TX LAN interface adapter.

The LAN adapter supports both 10 Mbit/s and 100 Mbit/s operations and automatically detects which network type is being used.

- 1 Connect the RJ-45 plug on your network cable to the LAN connector on the LAN Adapter. Push the plug into the connector until the plug clicks into place.



- 2 Attach the other end of the LAN cable to a hub (or into a wall socket that is connected to a hub).

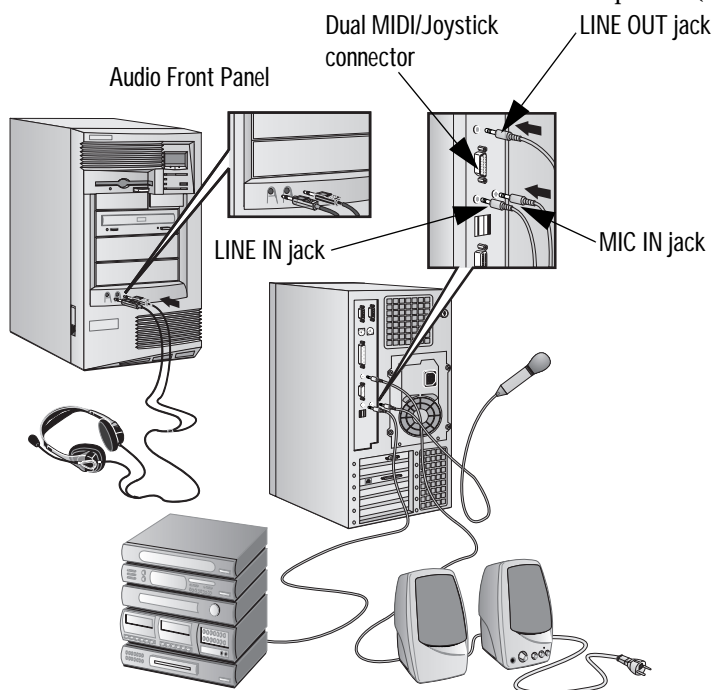
Let your Network Administrator know that you are connecting your PC Workstation to the network.

For further instructions on configuring your network connection, refer to "Configuring Your Network Connection" on page 103.

Refer also to the online *Network Administrator's Guide* (preloaded onto your PC Workstation) for further instructions on setting up your PC Workstation for a LAN connection.

Connecting Audio Accessories

Your PC Workstation has a Headphone Out jack and a Microphone In jack on the Audio Front Panel (see page 98 for more information). A LINE IN jack, LINE OUT jack, MIC IN jack, and MIDI/Joystick connector are located on the rear panel (see page 95 for details).



NOTE

The internal speaker and LINE OUT jack on the rear panel of your PC Workstation are deactivated when you use the Headphones jack on the Audio Front Panel.

The internal speaker is deactivated when you use the LINE OUT jack. External speakers you connect should have a built-in power supply.

The audio accessories shown here (microphone, speakers, and audio system) are not supplied with your PC Workstation.

Volume can be controlled through the HP enhanced keyboard, or the software volume control.

WARNING

To avoid discomfort from unexpected noise, always turn down the volume before connecting headphones or speakers.

Listening to loud sounds for prolonged periods may permanently damage your hearing.

Before putting on headphones, place them around your neck and turn down the volume. When you put on the headphones, slowly increase the volume until you find a comfortable listening level, then leave the volume control in that position.

1 Setting Up and Using Your PC Workstation

Connecting an External SCSI Accessory

Connecting an External SCSI Accessory

Your PC Workstation is equipped with an UltraWide 16-bit SCSI connector for external SCSI devices.

When an external SCSI device is connected, the UltraWide 16-bit SCSI controller automatically switches to non-Ultra mode (maximum capacity of 20 MBs per second).

An external SCSI device is connected as follows:

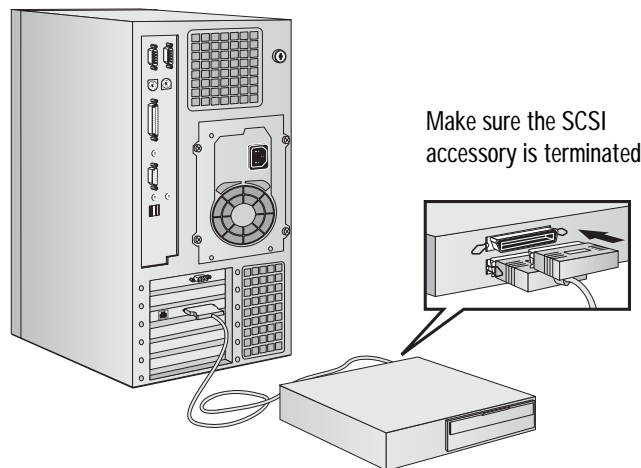
- 1 You should assign an unused SCSI address to the accessory. SCSI addresses range from 0 to 15 for wide 16-bit SCSI. The SCSI address 0 is reserved for the first SCSI hard disk drive and SCSI address 7 is reserved for SCSI controller (the default for narrow and wide SCSI devices).

Refer to the manual provided with the SCSI accessory for instructions on selecting a SCSI address.

NOTE

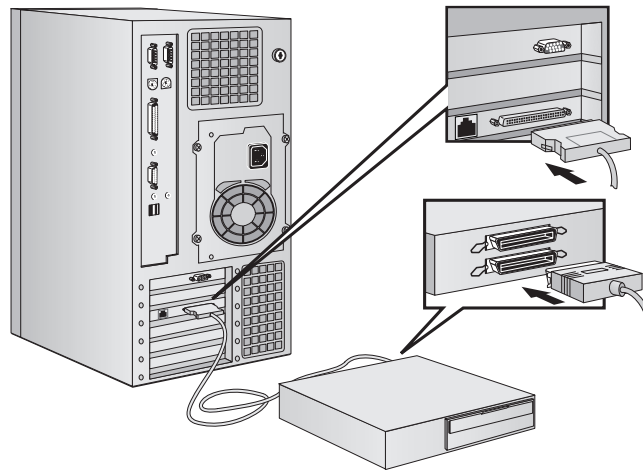
You don't need to set a SCSI address for Plug and Play SCSI devices (SCSI devices which support the SCAM protocol).

- 2 Make sure the SCSI accessory is terminated correctly—either internally or by a terminating resistor (refer to the manual provided with the SCSI accessory).



1 Setting Up and Using Your PC Workstation
Connecting an External SCSI Accessory

- 3 Connect the SCSI accessory to your PC Workstation's external 16-bit SCSI connector with a shielded SCSI cable.



- 4 Refer to the manual provided with the SCSI accessory to learn how to install any software that may be necessary to use it.

NOTE

The total length of the external SCSI cables should not exceed 3 meters (approximately 10 feet).

Contact your dealer to order shielded HP SCSI cables to connect external SCSI accessories.

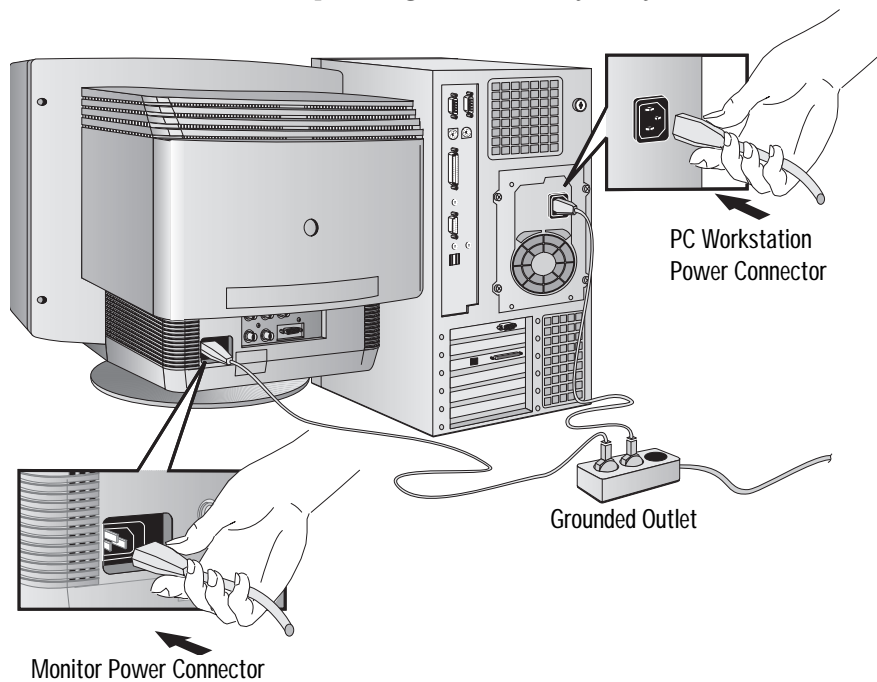
See page 37 for information on how to connect internal SCSI devices.

1 Setting Up and Using Your PC Workstation

Connecting the Power Cords

Connecting the Power Cords

- 1 Remove any warning labels that may be covering the computer's power connector on the rear of the computer.
- 2 Connect the power cords to the display and the computer. (*The connectors are shaped to go in one way only.*)



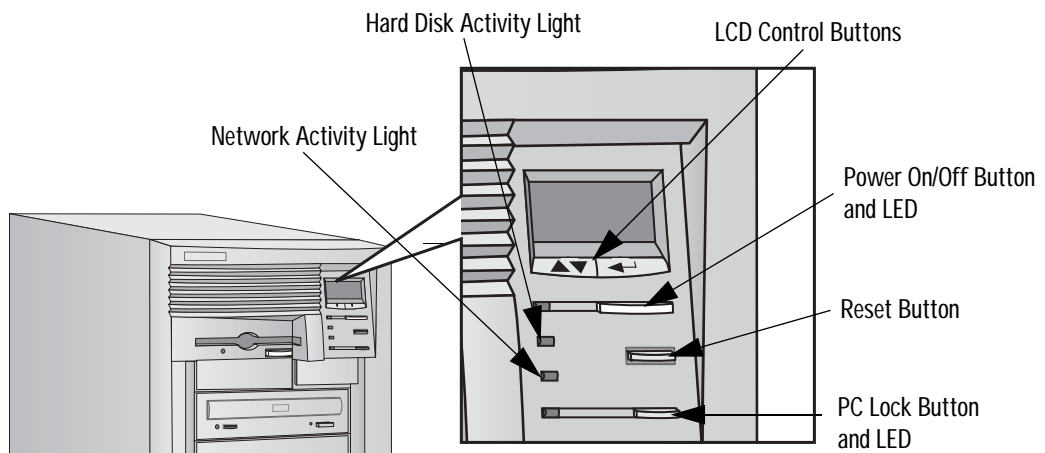
- 3 Connect the display's power cord and the computer's power cord to grounded outlets.



WARNING

For your safety, always connect the equipment to a grounded wall outlet. Always use a power cord with a properly grounded plug, such as the one provided with this equipment, or one in compliance with your national regulations. This PC Workstation is disconnected from the power by removing the power cord from the power outlet. This means the PC Workstation must be located close to a power outlet that is easily accessible.

Your PC Workstation's Hardware Control Panel

The hardware control panel is located on the front of your PC Workstation.



- | | |
|---|--|
| PC Lock Button | With HP Lock installed, you can use this button to prevent unauthorized access of your PC Workstation during your absence. Your applications will remain active. You unlock the PC Workstation by entering a password (refer to "Setting Passwords" on page 18). |
| HP MaxiLife and it's Liquid Crystal Display (LCD) | HP MaxiLife and it's LCD helps you diagnose problems with your PC Workstation and provides system information you may need to obtain support. Press one of the LCD control buttons to display the menu. Use  to scroll through the menu items and  to select the item required. For more information on using the LCD, refer to "Using HP MaxiLife to Diagnose Problems" on page 75. |
| Network Activity Light | This light glows/flickers when your PC Workstation is accessing the network. |
| Hard Disk Activity Light | This light glows/flickers when your hard disk drive is being accessed. |

1 Setting Up and Using Your PC Workstation

Starting and Stopping Your PC Workstation

Starting and Stopping Your PC Workstation

Starting Your PC Workstation for the First Time

If your PC Workstation has preinstalled software, it is initialized the first time you start the PC Workstation. The software initialization process takes a few minutes. This process sets up the software in your language and sets up your software to use the hardware installed in your computer (you can change the settings after the software has been initialized).

Initializing Your Software

NOTE

Do NOT switch OFF the PC Workstation while the software is being initialized—this could cause unexpected results.

To initialize your software:

- 1 Turn on the display first, and then the PC Workstation.

When the PC Workstation is switched on, the HP PC Workstation's logo is displayed. The PC Workstation performs a Power-On-Self-Test (POST). Press **[Esc]** if you want to view the POST details in the HP Summary Screen (refer to "The HP Summary Screen and Setup Program" on page 101).

If an error is detected during the Power-On-Self-Test, the PC Workstation will automatically display the error. You may be prompted to press **[F2]** to start the *Setup* program to correct the error.

- 2 The software initialization routine starts. It displays the software license agreement, gives you an opportunity to read Working in Comfort (ergonomic advice for computer users), and then asks questions about the PC Workstation. For example:
 - The name of the person who will use the PC Workstation and your company name. (If necessary, the name of the user can be modified later.)

1 Setting Up and Using Your PC Workstation

Starting and Stopping Your PC Workstation

- The current date and time.
 - The type of printer (for example, HP LaserJet 5L). This is shown on the front of the printer. You also need to enter the connection used by the printer.
- 3 While the initialization program is running, you can complete the Warranty Registration card that came with this manual.
 - 4 When the initialization routine has finished, click OK and the PC Workstation will restart.

Creating Back-up Diskettes

It is very important that you create master diskettes for your preloaded application software and as an Emergency Repair Disk for the operating system, as soon as possible. HP recommends that you use new diskettes for this purpose. To create these back-up diskettes, follow the instructions that appear on screen when you first start your PC Workstation.

For more information on how to create these diskettes, refer to the documentation that came with your application software or operating system.

Starting Your PC Workstation

- 1 Before you start your PC Workstation, first switch on the display.
- 2 Start your PC Workstation in one of these ways:
 - Press the power button on the front panel.
 - Press the keyboard space bar.

The keyboard power-on feature will work only if Space-bar is enabled in the Power menu of the *Setup* program (refer to page 101) and the system board switch 8 (KEYB power) is DOWN (the default setting). Refer to page 99 for more information on system board switches.

1 Setting Up and Using Your PC Workstation

Starting and Stopping Your PC Workstation

When you switch on the computer, it carries out the Power-On-Self-Test (POST) while the PC Workstation's logo is displayed. If you wish to view the POST details, press to get the HP Summary Screen. If there is an error in the POST, the error will automatically be displayed. For details, refer to "If a POST Error Message is Displayed" on page 61.

- 3 If you have set a password in the PC Workstation's *Setup* program, the password prompt displays after the POST has completed. If the Password prompt is displayed, type your password and press to be able to use the PC Workstation.

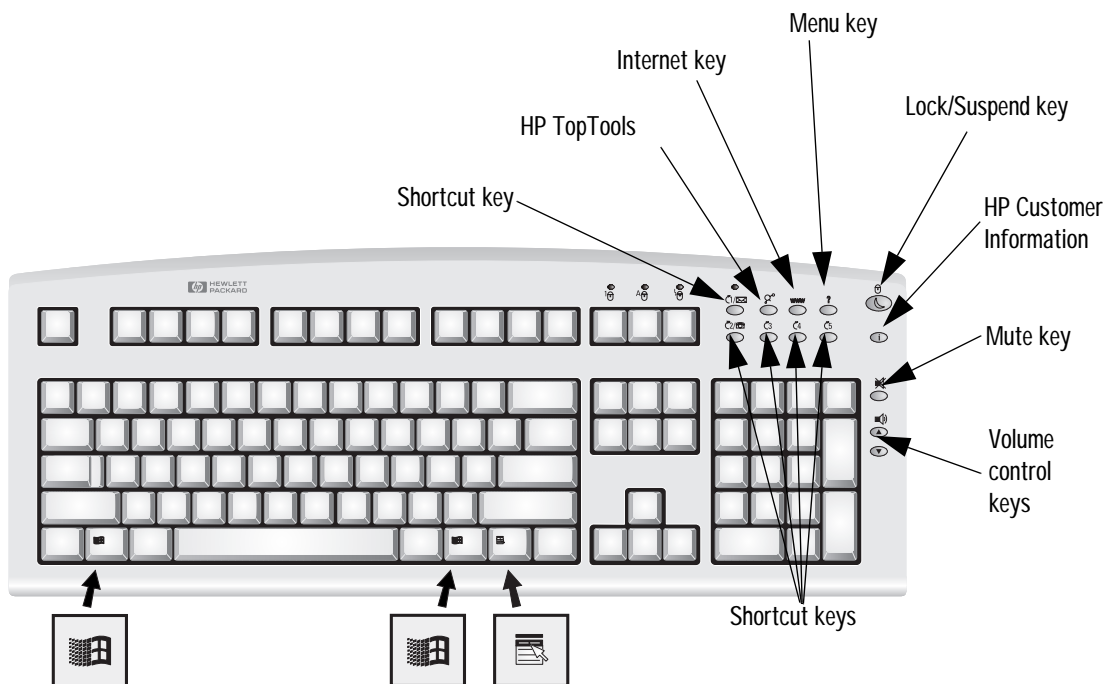
Stopping Your PC Workstation

To stop the PC Workstation, make sure that you have exited all programs and the operating system (if necessary), and then press the power button on the control panel.

Using Your HP Enhanced Keyboard

The HP enhanced keyboard includes soft keys you can use to:

- Display and configure the actions assigned to keys.
- Perform one-touch shortcuts to start applications, open files, or open sites on the WWW.
- Launch the Internet browser supplied with your system.
- Lock or suspend your PC Workstation.
- Access HP TopTools and customer information.
- Mute or adjust the volume of the audio system.



1 Setting Up and Using Your PC Workstation

Using Your HP Enhanced Keyboard

Menu Key	Pressing the Menu soft key displays the soft key section of the HP enhanced keyboard on your screen. Click any of the keys on the screen to display the action assigned to an individual key or to change or assign an action to a key. Shortcut keys are provided specifically for user-defined actions.
Shortcut Keys	The Shortcut soft keys can be used to start an application, open a document, or open a site on the Internet. Actions can be assigned to the Shortcut keys by pressing the Menu key and clicking the key you want to configure in the keyboard displayed on your screen.
Internet Key	This soft key is used to start the Netscape™ Communicator 4.0 browser configured on the PC Workstation (default setting). The Microsoft® Internet Explorer is also available.
Lock/Suspend Key	<p>The action of the Lock/Suspend key is configured by pressing the Menu Key, and then clicking on Configure, the Extended Keys tab and the onscreen Lock button. With HP Lock installed, the actions you can specify for the Lock/Suspend key are:</p> <ul style="list-style-type: none">• Launch screen saver• Lock the front panel
HP TopTools	Pressing this soft key opens HP TopTools. This application helps you manage and reduce overall ownership costs and provides advanced PC management tools that can, for example, be used for remote BIOS updates and security management.

NOTE

Before using HP TopTools for the first time, you must install it as follows: From the Start menu, select Programs, then HP DMI, then Setup. The HP TopTools application is installed automatically.

1 Setting Up and Using Your PC Workstation
Using Your HP Enhanced Keyboard

The System Health window of the HP TopTools hardware monitoring facility provides information on:

- Fan Control in the HP UltraFlow cooling system
- System Temperature for PC Workstation components
- ECC Error Notification (only when ECC DIMMs are installed)
- Voltage Monitoring for components

HP Customer
Information

This soft key accesses HP Customer Information, which includes:

- Information on product features
- The preloaded software on the system
- Details on how to configure the HP enhanced keyboard
- Information on how to configure the WWW browser
- Detailed HP support information
- Links to the HP PC and PC Workstation website

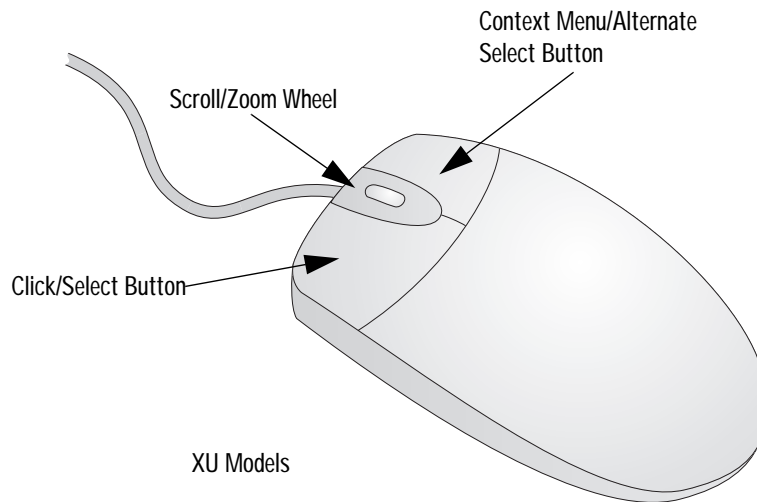
Mute and Volume Keys

Pressing the Mute key mutes the audio, or restores the audio if it has been muted. The Volume keys can be used to control the volume level.

For more information on controlling audio on your system, see the *Using Sound* guide preloaded onto your PC Workstation.

1 Setting Up and Using Your PC Workstation
Using Your HP Enhanced Mouse

Using Your HP Enhanced Mouse



XU Models

Your HP enhanced mouse includes the following additional features:

- A combination mouse wheel/button that enables you either to scroll down by pushing the mouse wheel forwards and scroll up by pushing it backwards.
- A mouse wheel that enables you to zoom in (enlarge) by holding the **Ctrl** key down and pushing the mouse wheel forwards, or zoom out (reduce) by holding the **Ctrl** key down and pushing it backwards.

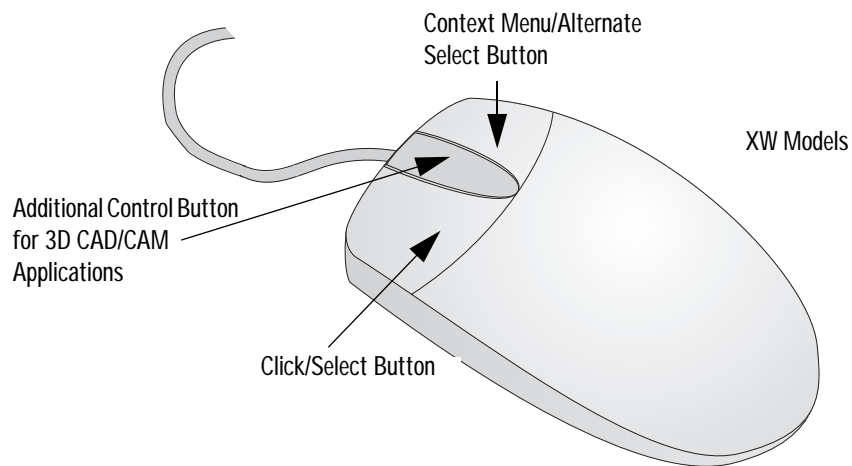
NOTE

The scroll functions only work in Windows NT and Windows 95 applications that support scrolling. The zoom function works only in Microsoft Office 97 compatible applications that support zoom.

Using the mouse setup, you can assign each mouse button and the mouse wheel to a different function. Also, you can change the scroll function to work in a different way.

To do this or to see the available scroll options, click the **Start** button, select **Settings-Control Panel**, double-click **Mouse**, and select the **Buttons** tab.

1 Setting Up and Using Your PC Workstation Using Your HP Enhanced Mouse



XW Models

Your HP enhanced mouse includes the following additional features:

- A third control button — useful when using certain 3D CAD, CAM and other graphics-intensive Windows NT applications.
- Control buttons can be customized, using mouse setup, to perform different control functions according to user requirements.

NOTE

The third button control will only work in Windows NT and Windows 95 applications that support a third control button.


1 Setting Up and Using Your PC Workstation

Setting Passwords

Setting Passwords

You can set two passwords, the Administrator (or Supervisor) password and the User password, to provide two levels of protection for your PC Workstation. You set both passwords using the Security menu in the *Setup* program (refer to “The HP Summary Screen and Setup Program” on page 101).



Setting an Administrator Password

Set the Administrator password to protect the PC Workstation's configuration in *Setup*. An Administrator password can provide a power-on password prompt that prevents your PC Workstation from being started or used in your absence. You can also use this password to start the PC Workstation when the keyboard and mouse are locked—you must type the password and press  to unlock the keyboard.

If you have set both an Administrator password and a User password, and you enter the *Setup* program using the User password, you will be restricted in your ability to change setup items. If you enter the *Setup* program with an Administrator password, you will have no restrictions.

To set an Administrator password:

- 1 Start the *Setup* program (refer to “The HP Summary Screen and Setup Program” on page 101).
- 2 Select the Security menu.
- 3 Select the Administrator password submenu.
- 4 Choose the Set Administrator password setup item. You will be asked to enter your password twice. Save your changes when you exit the *Setup* program by selecting Exit, then Exit Saving Changes.

To remove the password, follow the same procedure as to set a password. You will be asked to enter the existing password first. Then, for the new password, leave the password field blank and press . To confirm your choice, press  a second time.


NOTE

If you forget your password, refer to “If You Have Forgotten Your Password” on page 72.

Setting a User Password

A User password can only be set if an Administrator password has already been set.



Set a User password to:

- Provide a power-on password prompt to prevent your PC Workstation being started or used in your absence.
- Start the PC Workstation when the keyboard and mouse are locked—you must type the password and press  to unlock the keyboard (refer to “The HP Summary Screen and Setup Program” on page 101).

If you have set both an Administrator password and a User password, and you enter the *Setup* program using the User password, you will be restricted in your ability to change setup items. If you enter the *Setup* program with an Administrator password, you will have no restrictions.

To set a User password:

- 1 Start the *Setup* Program.
- 2 Select the Security menu.
- 3 Select the User Password submenu.
- 4 Choose the Set User Password setup item. You will be asked to enter your password twice. Save your changes when you exit the *Setup* program by selecting Exit, then Exit Saving Changes.

To remove the password, follow the same procedure as to set a password. You will be asked to enter the existing password first. Then, for the new password, leave the password field blank and press . To confirm your choice, press  a second time.

NOTE

If you forget your password, refer to “If You Have Forgotten Your Password” on page 72.

1 Setting Up and Using Your PC Workstation

Using Power Management

Using Power Management

Power management enables you to reduce your PC Workstation's overall power consumption by slowing down the PC Workstation's activity when it is idle. To configure power management, refer to the Power menu in the *Setup* program. (refer to "The HP Summary Screen and Setup Program" on page 101, for more information).

Refer to your operating system documentation for detailed information about the capability of your operating system to implement power management.

Additional Information and Help

Additional information about your PC Workstation is preloaded on your PC Workstation's hard disk drive. This information includes:

- New features—what is new and special about your PC Workstation
- Working in comfort—guidance on ergonomic issues
- Using Sound—provides guidance on audio issues
- Network Administrators Guide — provides instructions on setting up your PC Workstation for a LAN connection.
- Glossary

Users of Windows 95 and Windows NT 4.0 can access this information by opening the Start menu in the task bar and selecting **Programs> HPInfo.**

Recycling an Old HP PC Workstation

HP has a strong commitment towards the environment. This HP PC Workstation has been designed to respect the environment as much as possible.

HP can take an old computer back for recycling when it reaches the end of its useful life.

In several countries, HP has a product take-back program. Collected equipment is sent to one of HP's recycling facilities in Europe or the USA. As many parts as possible are reused, the remainder are recycled. Special care is taken with batteries and other potentially toxic substances, which are reduced to non-harmful components through a special chemical process.

If you require more details about HP's product take-back program, contact your dealer or your nearest HP Sales Office.

1 Setting Up and Using Your PC Workstation
Recycling an Old HP PC Workstation

2

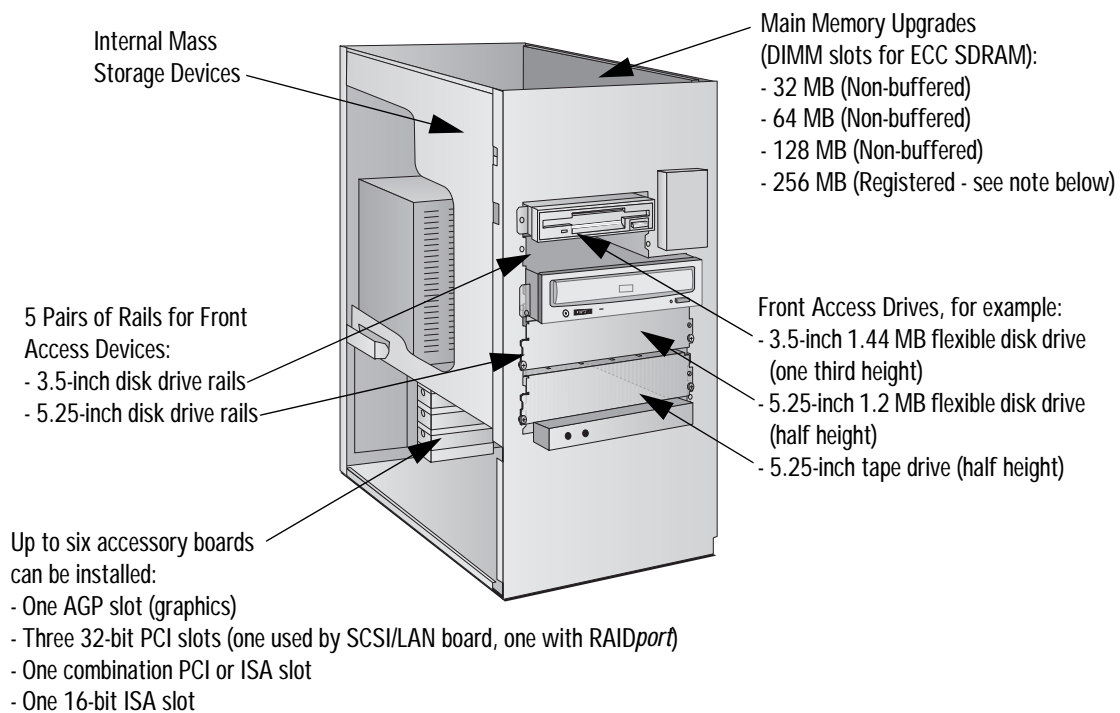
How to Install Accessories Inside Your PC Workstation

This chapter explains how to install accessories, such as extra memory, accessory boards, and additional disk drives, in your PC Workstation.

2 How to Install Accessories Inside Your PC Workstation

Supported HP Accessories

This chapter describes how to install memory, mass storage devices, and accessory boards in your computer.



Contact your dealer for an up-to-date list of supported devices.

NOTE

256 MB registered ECC SDRAM DIMMs cannot be used with non-buffered 32 MB, 64 MB or 128 MB DIMMs.

2 How to Install Accessories Inside Your PC Workstation

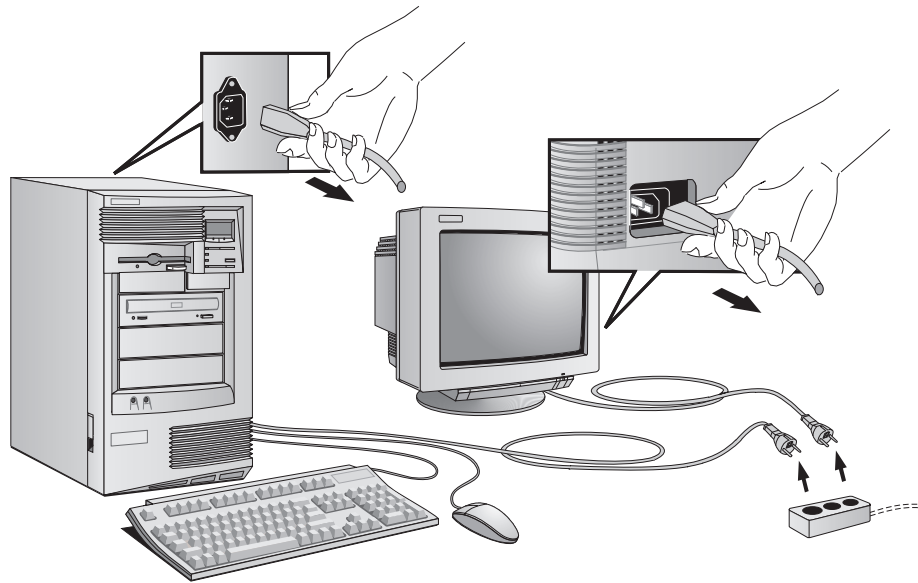
Removing and Replacing the Cover

WARNING

For your safety, never remove the PC Workstation's cover without first removing the power cord from the power outlet, and any connection to a telecommunications network. Always replace the cover on the PC Workstation before switching it on again.

Removing the Cover

- 1 Switch off the display and computer.
- 2 Disconnect all power cables and any telecommunications cables.

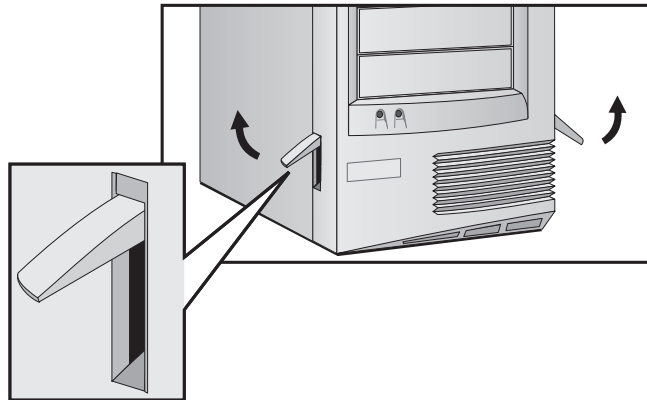


- 3 If necessary, unlock the cover using the key on the back panel.

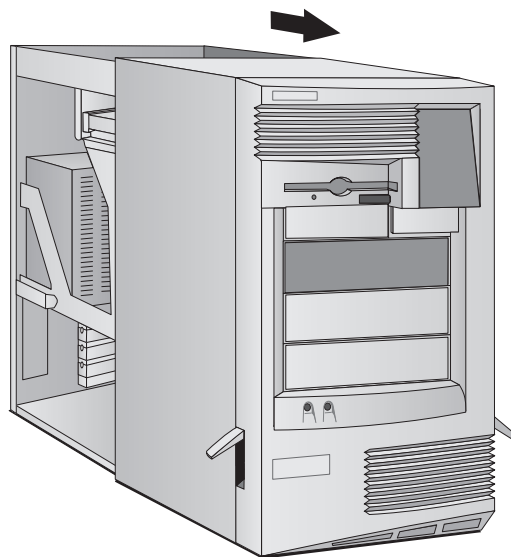
2 How to Install Accessories Inside Your PC Workstation

Removing and Replacing the Cover

- 4 Lift the two latches on the front sides of the computer upwards.



- 5 Grasp the cover on the sides at the back of the computer and slide it forwards and off the computer.

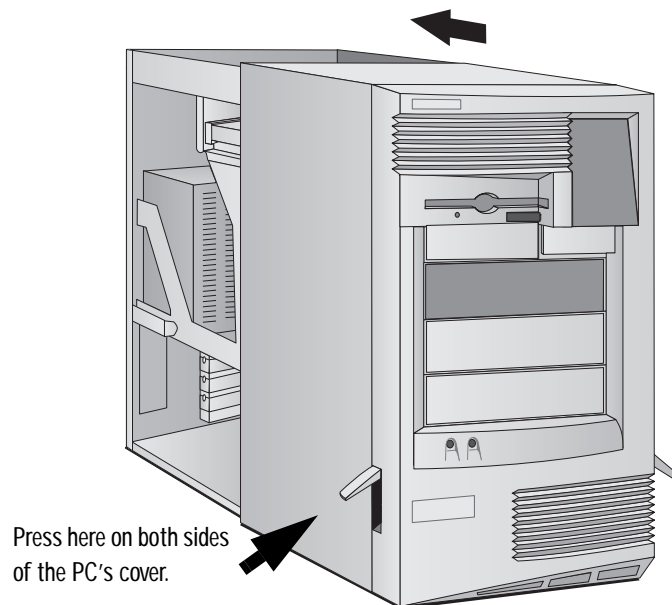


2 How to Install Accessories Inside Your PC Workstation

Removing and Replacing the Cover

Replacing the Cover

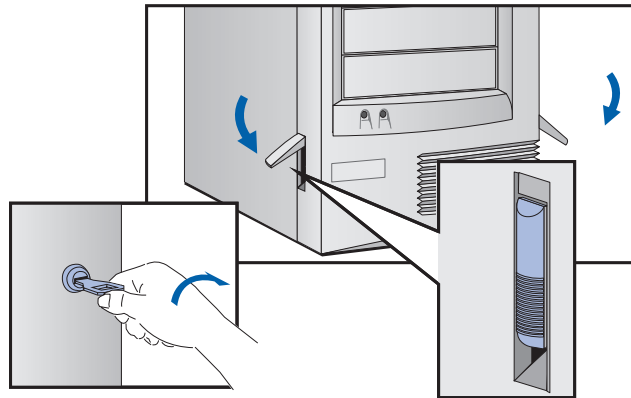
- 1 Ensure that you have installed all your accessories and that all internal cables are properly connected and safely routed.
- 2 Ensure that the two latches on the front sides of the cover are lifted up, and that the lock is unlocked.
- 3 Slide the cover onto the computer, making sure that the two guides at the bottom of the case slide into the two rails at the base of the computer. Firmly slide the cover backwards into position.



2 How to Install Accessories Inside Your PC Workstation

Removing and Replacing the Cover

- 4 Lower the latches on the front sides of the cover.



- 5 If required, lock the cover using the key provided.

- 6 Reconnect all the power cables.

Intrusion Monitor

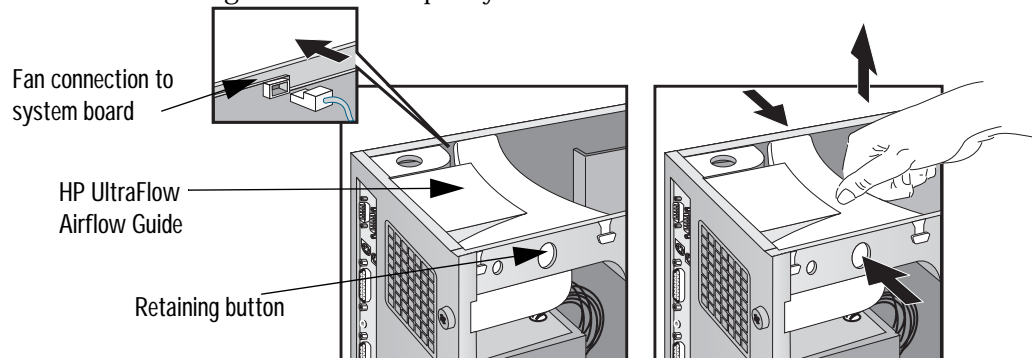
Your PC Workstation is equipped with an intrusion monitor, which is located on the front of the PC Workstation, behind the Hardware Control Panel. It is designed to detect whether your PC Workstation has been opened since the last time it was used:

- If your PC Workstation has been opened, it is assumed that the system configuration has changed and a full start-up check is carried out.
- If your PC Workstation has not been opened, it is assumed that the system configuration has not changed and a reduced start-up check is carried out.

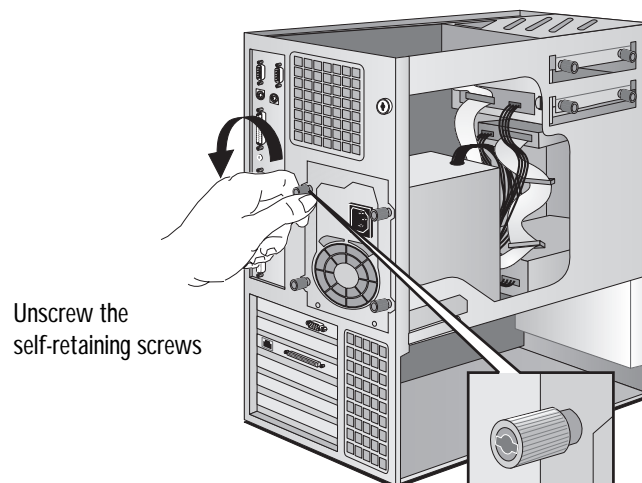
Moving the Power Supply

You can slide the power supply unit out of the computer to improve access to the system board and the cables at the rear of the disk drives.

- 1 Disconnect the computer's power cord and any telecommunications cable.
- 2 Remove the computer's cover (see page 25).
- 3 Press the retaining buttons on each side of the HP UltraFlow airflow guide and lift it partly out of the PC Workstation's case.



- 4 Remove the fan connection to the system board and lift the airflow guide completely out of PC Workstation's case.
- 5 Unscrew the four self-retaining screws at the back of the power supply.



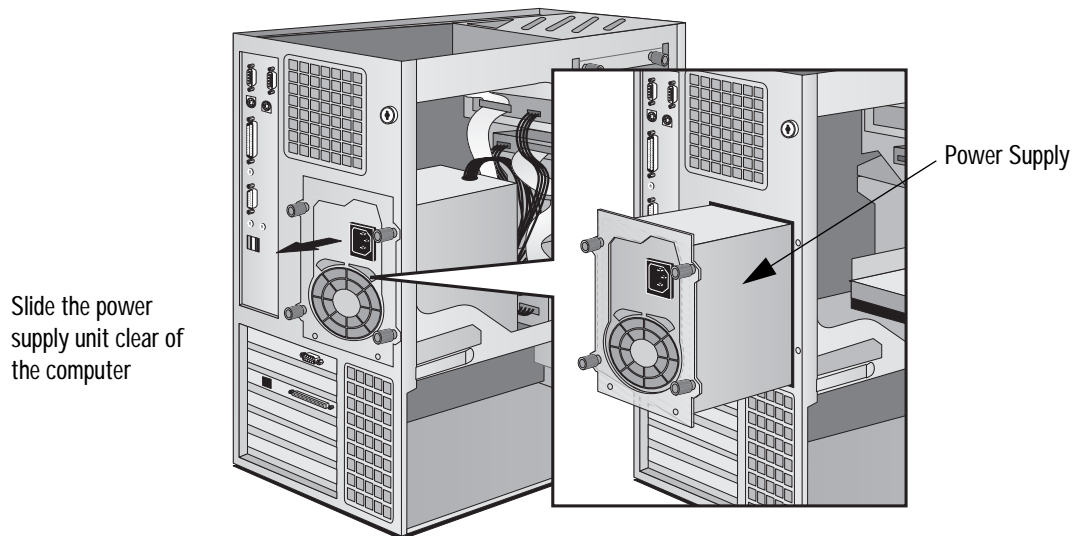
2 How to Install Accessories Inside Your PC Workstation

Moving the Power Supply

WARNING

To avoid electrical shock, do not open the power supply.

- 6 Slide the power supply out of the computer until it stops—the power supply unit remains connected to the computer.



Replacing the Power Supply after Installing Accessories

- 1 Check that all internal cables are safely routed.
- 2 Slide the power supply back into the computer.
- 3 Tighten the four self-retaining screws.
- 4 Replace the HP UltraFlow airflow guide.
- 5 Reconnect the fan to the system board.

Installing Memory

Main Memory Modules

If you need more main memory to run your application software, you can install up to 1GB of memory in four DIMM slots.

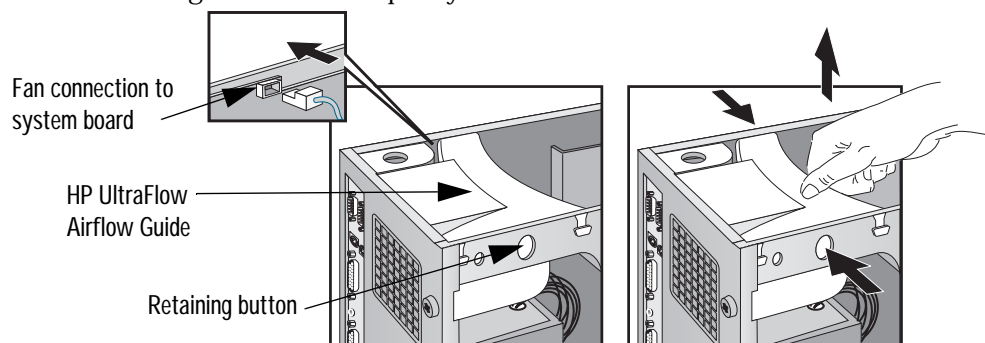
Main memory upgrades are available in single 32 MB, 64 MB and 128 MB Non-Buffered ECC SDRAM or 256 MB Registered ECC SDRAM memory modules. You should note that Registered ECC SDRAM cannot be used with Non-Buffered memory modules. Do not attempt to combine these two types of memory.

CAUTION

Static electricity can damage electronic components. Turn off all equipment. Do not let your clothes touch the accessory. To equalize the static electricity, rest the accessory bag on top of the power supply while you are removing the accessory from the bag. Handle the accessory as little as possible and with care.

To install a main memory module:

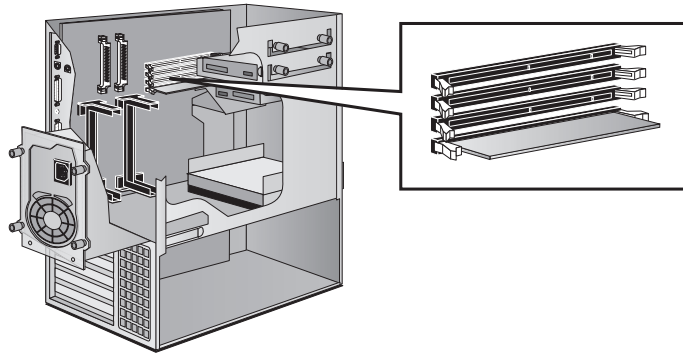
- 1 Disconnect the computer's power cord and any LAN or telecommunications cable.
- 2 Remove the computer's cover (see page 25).
- 3 Press the retaining buttons on each side of the HP UltraFlow airflow guide and lift it partly out of the PC Workstation's case.



2 How to Install Accessories Inside Your PC Workstation

Installing Memory

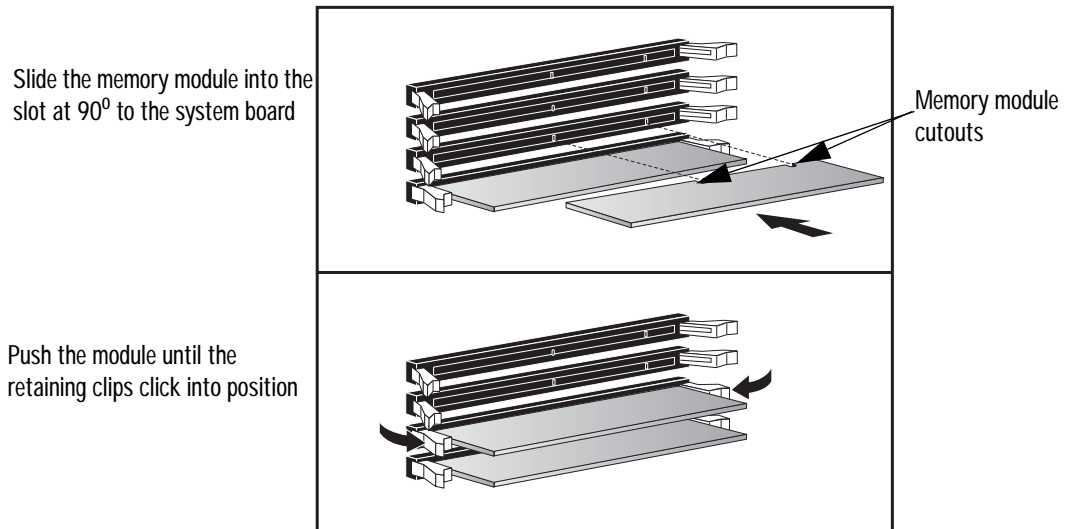
- 4 Remove the fan connection to the system board and lift the airflow guide completely out of PC Workstation's case.
- 5 Remove the Ultra wide 16-bit SCSI cable from the system board.
- 6 Remove the power supply and the transparent airflow guide covering the processor sockets (if needed).
- 7 Remove the floppy disk drive data cable from the system board.
- 8 The location of the memory module slots is shown here.



2 How to Install Accessories Inside Your PC Workstation

Installing Memory

- 9 Slide the memory module into the slot at 90° to the system board (with the cutouts furthest away from the processor).



- 10 *Firmly* press the memory module *completely* into the connector until the retaining clips click into position.
- 11 Repeat this procedure for each additional memory module you want to install.
- 12 Install any other accessories if necessary, then replace all units and reconnect all cables and power cords. Replace the cover (see page 27).
- 13 Check the HP Summary Screen to verify the new configuration (refer to "The HP Summary Screen and Setup Program" on page 101).

2 How to Install Accessories Inside Your PC Workstation

Installing Memory

Installing More Memory on the Video Adapter

For XU Models

Your PC Workstation is equipped with a video adapter that supports 2D and 3D graphics. If you need to have more video memory to display more colors, higher resolutions, or for increased speed, you can install more video memory on the video adapter.

To find out about available video memory upgrades, refer to the HP World Wide Web Site at <http://www.hp.com/go/kayaksupport/>

Refer to page 90 for information on video resolutions.

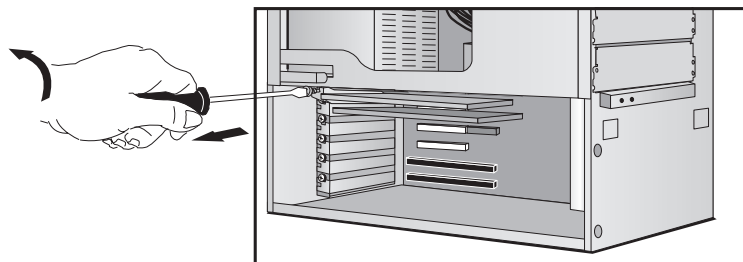
CAUTION

Static electricity can damage electronic components. Turn off all equipment. Do not let your clothes touch the accessory. Handle the accessory as little as possible and with care.

To install a video memory module:

- 1 Switch off the display and computer, and disconnect the power supply cables and any telecommunications cables. Remove the computer's cover (see page 25) and carefully place the PC Workstation on its side.
- 2 Carefully remove the board from the accessory slot, holding the board at each end by its top edge. Do not bend the board. With its components facing up, place the board on a clean, flat, solid, static-free surface. Handle the board by its edges.

(The different accessory slots are identified in the illustration on page 96.)



- 3 Attach the memory module to the connectors on the video adapter.

- 4 Replace the video adapter in the computer. Carefully slide the board back into its accessory slot. Firmly press the board into the socket. Make sure that the board slides into the socket completely and does not touch components on other boards. Secure the video adapter.
- 5 Install any other accessories before replacing the cover (see page 27). Reconnect all cables and power cords.

Completing the Video
Memory Installation
Procedure

- 1 Switch on the PC Workstation.
- 2 Check the HP Summary Screen to verify the new configuration (refer to "The HP Summary Screen and Setup Program", on page 101).

NOTE

If you need to use a special video driver for your application, you may be asked to insert the CD-ROM or diskette containing the driver.

Video Adapter
Accessories Available
from Other Sources

Additional accessories, including memory upgrades and a video MPEG module, are available for your video adapter. However, these accessories cannot be ordered from HP. Contact your dealer for more details about these accessories.

For XW Models with
HP Visualize FX4

To add a texture module to the HP Visualize FX4, refer to the *Texture Module Accessory User's Guide* shipped with this accessory.

2 How to Install Accessories Inside Your PC Workstation

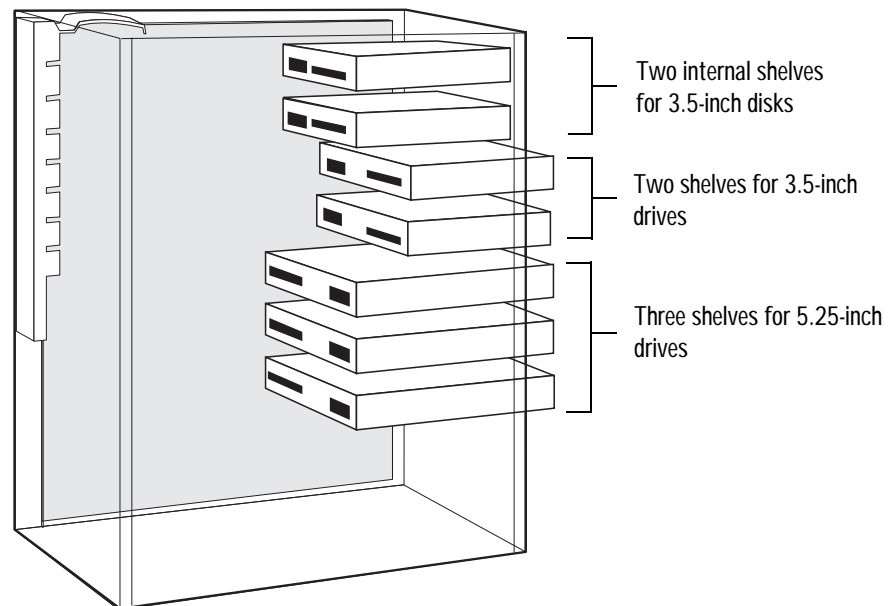
Installing Mass Storage Devices

Installing Mass Storage Devices

If you need extra mass storage space for your application software, you can install additional mass storage devices.

The computer has two internal shelves (for hard disk drives) and five front-access drive shelves (for front-access drives and hard disk drives).

Your computer is supplied with one 3.5-inch flexible disk drive and a CD-ROM drive. If your computer is supplied with a hard disk, the hard disk will be installed in the second internal shelf

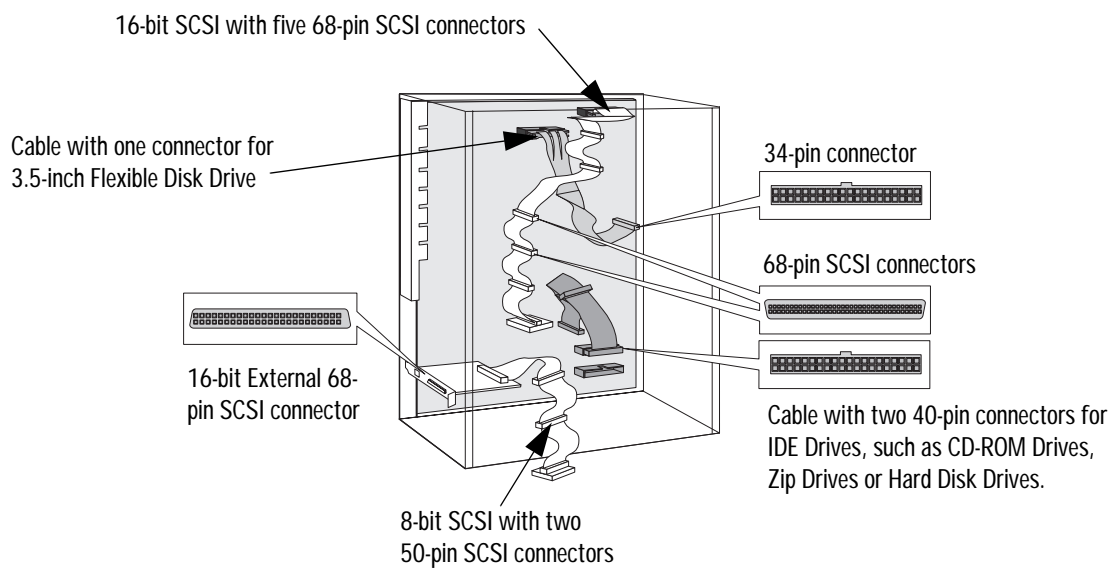


2 How to Install Accessories Inside Your PC Workstation

Installing Mass Storage Devices

Connecting Devices

If you add an IDE Zip drive, hard disk drive, CD-ROM drive, CD-RW drive, or tape drive, you need to connect it to power and data cables. The data cables and connectors provided are shown below:



2 How to Install Accessories Inside Your PC Workstation

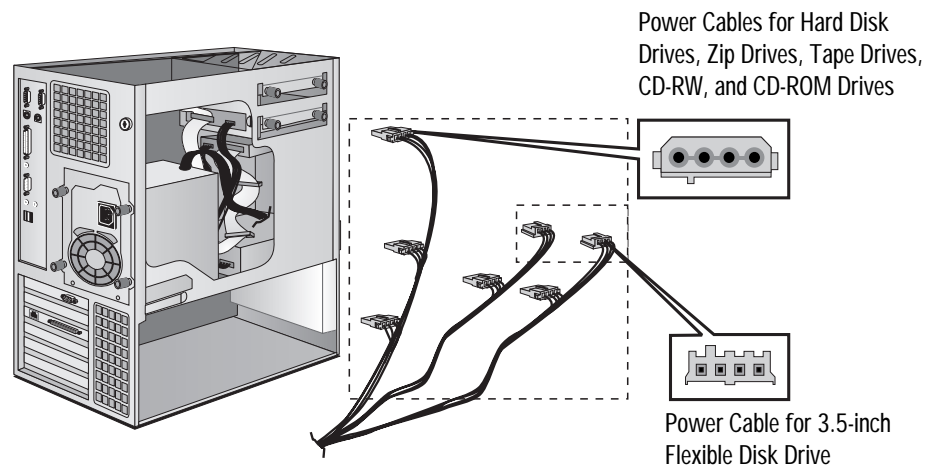
Installing Mass Storage Devices

Which Data Connectors to Use Your PC Workstation has the following cables and connectors which may be used by mass storage devices:

- A cable for UltraWide 16-bit SCSI with five connectors.
- A cable for UltraNarrow 8-bit SCSI with two connectors.
- A flexible disk drive cable with a single connector. This supports a flexible disk drive (the connector is attached to the flexible disk drive supplied).
- An Ultra ATA/33 IDE cable that supports two fast IDE devices. If you install a CD-ROM drive, CD-RW drive, a Zip drive, or a third hard disk drive, connect it to this cable.

Which Power Connectors to Use

There are two different types of power connectors—these are shown below.



Some of the power connectors will already be connected to devices. If you install a device that requires a different connector, the connector converter should be supplied with the device.

2 How to Install Accessories Inside Your PC Workstation
Installing Mass Storage Devices

Installing a Hard Disk Drive	<p>This PC Workstation has an integrated Ultra SCSI controller, an Ultra SCSI interface board and an integrated Ultra ATA-33 IDE controller.</p> <ul style="list-style-type: none">• The Ultra ATA-33 IDE controller, on the PCI bus, supports up to two fast (33 MB per second) IDE devices.• The Ultra wide 16-bit SCSI controller is dedicated to hard disk drives and supports up to five internal SCSI devices.• The Ultra SCSI 16-bit interface board, installed in a PCI slot, supports up to 13 external 16-bit SCSI devices and automatically switches to non-Ultra or standard mode (data transfer rate of 20 MB per second). The Ultra 8-bit internal connector supports up to two internal peripherals at up to 20 MB per second.
Disk Striping	<p>To achieve top performance through disk striping, a RAIDport™ is provided on the system board aligned with PCI socket 3.</p> <p>When the Adaptec® RAIDport adapter is installed in the PCI socket and RAIDport, the adapter sets up and accelerates disk striping on hard disks connected to the internal UltraWide 16-bit SCSI controller. The Adaptec® RAIDport adapter should be used with one or two striped hard disks.</p>
<div>NOTE</div>	<p>Disk striping is supported only in Windows NT 4.0.</p> <p>The Adaptec CI/O Array Manager software can be used to manage and view the performance of the adapter.</p> <p>Although the RAIDport adapter is normally set up to maximize disk performance ("RAID 0" configuration), it can instead be configured to provide mirroring for extra data security ("RAID 1" configuration).</p> <p>For more information, refer to "The HP FastRAID Option" on page 94.</p>
Before Installing an IDE Hard Disk	<p>Refer to the drive's installation guide to see if you must set jumpers or if there is a special installation procedure to follow.</p>

2 How to Install Accessories Inside Your PC Workstation

Installing Mass Storage Devices

Before Installing a SCSI Hard Disk

If you are installing an additional SCSI drive, you should assign an unused SCSI address to this accessory. SCSI addresses range from 0 to 7 for Ultra narrow 8-bit SCSI and from 0 to 15 for Ultra wide 16-bit SCSI. SCSI address 0 is used by the first SCSI hard disk drive and SCSI address 7 is reserved for the integrated SCSI controller (the default for narrow and wide SCSI devices).

NOTE

You do not need to select a SCSI address for Plug and Play SCSI hard disks (SCSI hard disks that support the SCAM protocol). SCAM is disabled if the RAIDport adapter is installed.

You should assign an unused SCSI address to the second SCSI hard disk drive (for example, SCSI address 1).

The SCSI address is usually configured with jumpers on the SCSI hard disk drive. Refer to the installation guide supplied with the drive for information on selecting a SCSI address.

Some internal SCSI disk drives may have termination resistors that must be removed or disabled before installation in your computer. Refer to the drive's installation guide for more details and to see if there is a special installation procedure to follow.

Installing a Hard Disk Drive in an Internal Shelf

CAUTION

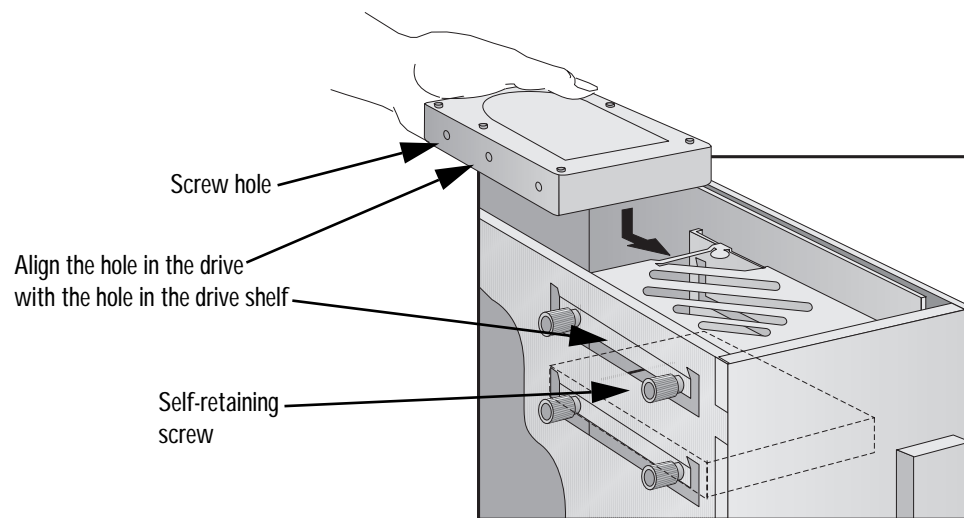
Hard disk drives larger than one inch (1") in height can only be housed in the lower internal shelf.

- 1 Disconnect the computer's power cord and any telecommunications cable.
- 2 Remove the computer's cover (see page 25).
- 3 Remove the fan connection to the system board (see the illustration on page 29).
- 4 Press the retaining buttons on each side of the HP UltraFlow airflow guide and lift it out of the PC Workstation's case.

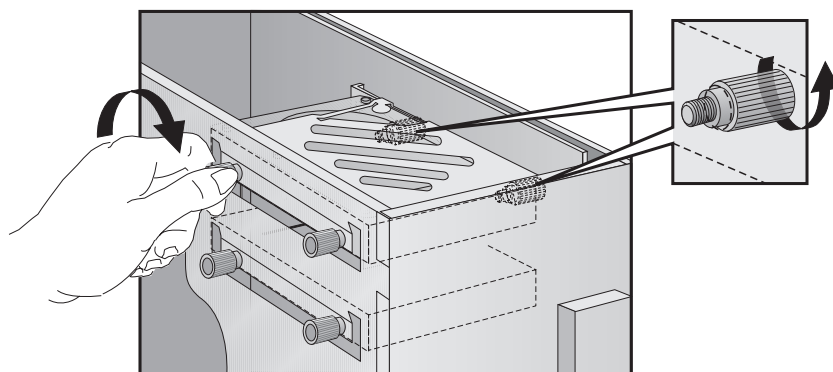
2 How to Install Accessories Inside Your PC Workstation

Installing Mass Storage Devices

- 5 Slide the power supply out to improve access to the internal shelf (see page 29).
- 6 Slide the drive into position in the first internal shelf and align the screw holes in the drive with the four self-retaining screws in the drive shelf.



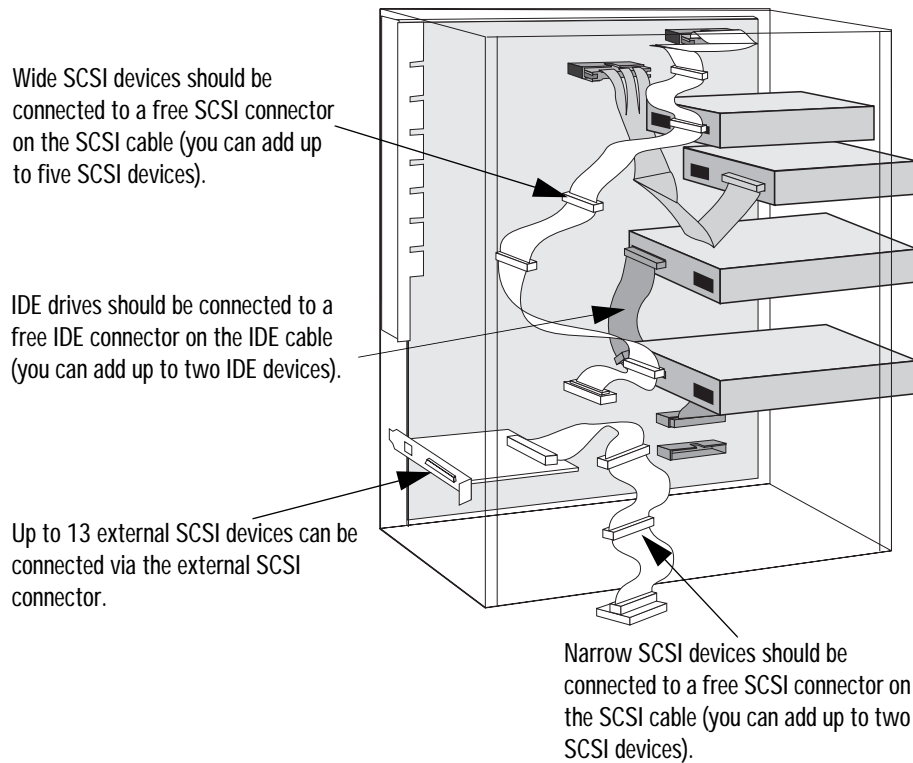
- 7 Secure the drive with the four self-retaining screws.



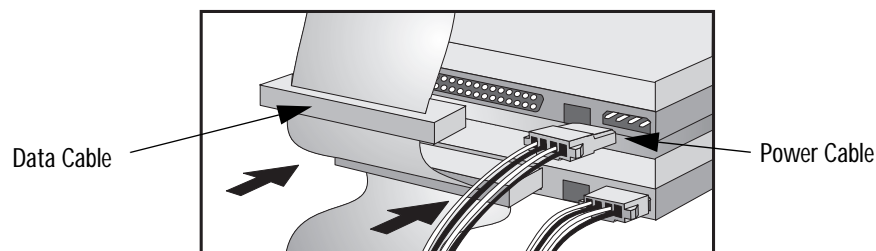
2 How to Install Accessories Inside Your PC Workstation

Installing Mass Storage Devices

8 Locate the appropriate data cable for the hard disk drive.



9 Connect the power cable and the data cable to the rear of the drive. (*The connectors are shaped to go in one way only.*)



10 Install any other accessories before completing the installation.

11 Turn to page 46 to complete the installation.

2 How to Install Accessories Inside Your PC Workstation

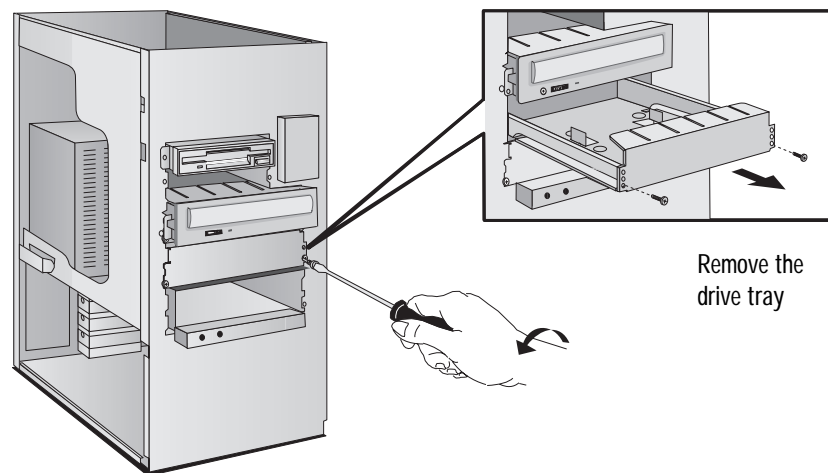
Installing Mass Storage Devices

Installing a Hard Disk Drive in a Front-Access Shelf

NOTE

To ensure your hard disk drive is properly located and cooled, you should only install drives that are up to one inch (1") in height and of a speed equal to or less than 7200 rpm in this shelf.

- 1 Disconnect the computer's power cord and any telecommunications cable.
- 2 Remove the computer's cover (see page 25).
- 3 Remove the fan connection to the system board (see the illustration on page 29).
- 4 Press the retaining buttons on each side of the HP UltraFlow airflow guide and lift it out of the PC Workstation's case.
- 5 Slide out the power supply to provide better access to the disk drive cables (see page 29).
- 6 Unscrew and remove an unused drive tray.

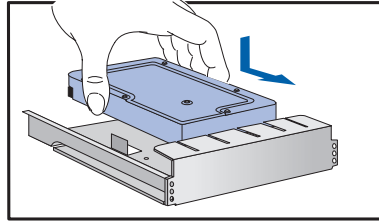


2 How to Install Accessories Inside Your PC Workstation

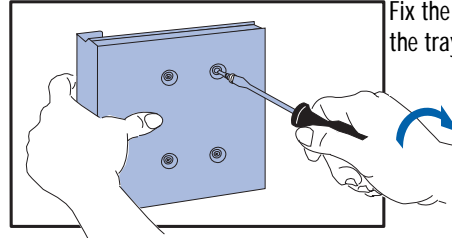
Installing Mass Storage Devices

7 Mount the drive on the tray as shown below.

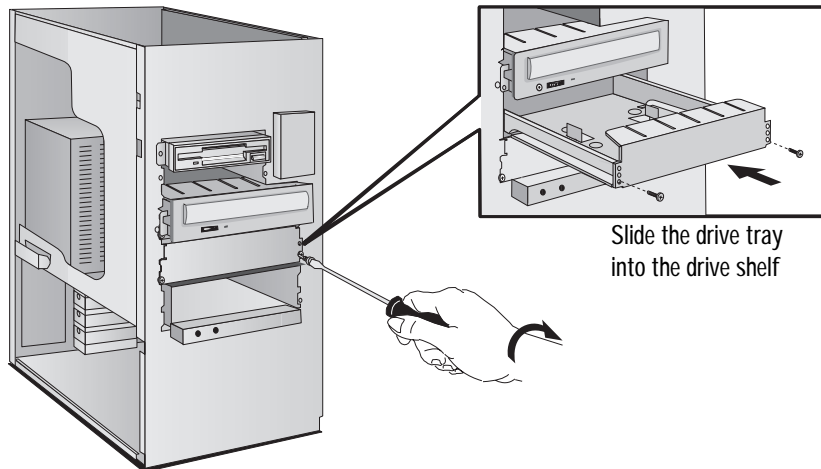
Set the drive on
the tray



Fix the drive to
the tray



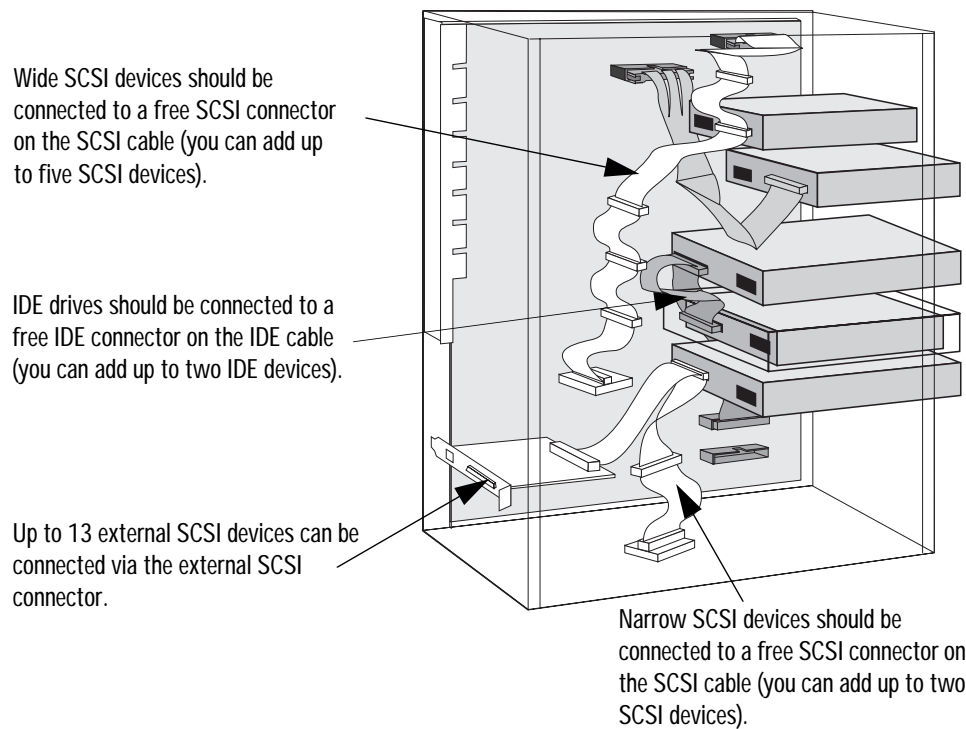
8 Slide the drive tray into the drive shelf and secure it.



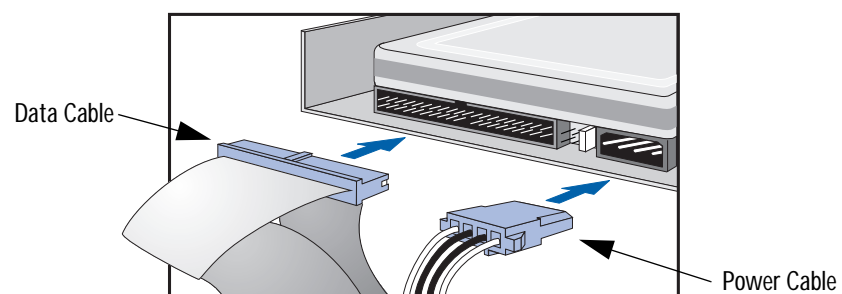
2 How to Install Accessories Inside Your PC Workstation

Installing Mass Storage Devices

9 Locate the appropriate data cable for the disk drive.



10 Connect the data and power cables to the rear of the device. (*The connectors are shaped to go in one way only.*)



11 Slide the power supply back into position, and tighten the four self-retaining screws (see page 30).

2 How to Install Accessories Inside Your PC Workstation

Installing Mass Storage Devices

- 12 Replace the HP UltraFlow airflow guide and reconnect the fan to the system board (see the illustration on page 29).
- 13 Install any other accessories before replacing the cover and completing the installation.
- 14 Follow the instructions below to complete the installation.

Completing the Installation of a Hard Disk Drive

When a SCSI Hard Disk Drive Is Installed

- 1 Switch on the computer.
- 2 To ensure compatibility, use the FDISK utility to delete any partitions on the new hard disk.
- 3 Re-boot the computer.

Refer to the operating system documentation for information on formatting a drive.

When an IDE Drive Is Installed

- 1 Switch on the computer.
- 2 To display the device in POST, press **[Esc]** while the PC Workstation re-starts.
- 3 If an error message appears, follow the instructions provided by the Error Message Utility. When prompted, press **[F2]** to run the *Setup* program.
- 4 Select the Advanced menu, and the IDE Devices submenu. In the Primary Master item, check that the details for the device have been correctly detected by the *Setup* program.
- 5 Press **[F3]** to save and exit *Setup*.

Refer to the operating system documentation for information on formatting a drive.

NOTE

If an IDE drive is removed, switch on the computer. The system BIOS will detect that the device is missing. Press **[F4]** to confirm that you want to remove the device. The system configuration will be updated automatically.

2 How to Install Accessories Inside Your PC Workstation

Installing Mass Storage Devices

Installing a Drive in a Front-Access Shelf

These instructions explain how to install a drive (such as a flexible disk drive, a CD-ROM drive, CD-RW drive, or a tape drive) in one of the front-access drive shelves. You should also refer to the manual supplied with the drive for any additional installation instructions.

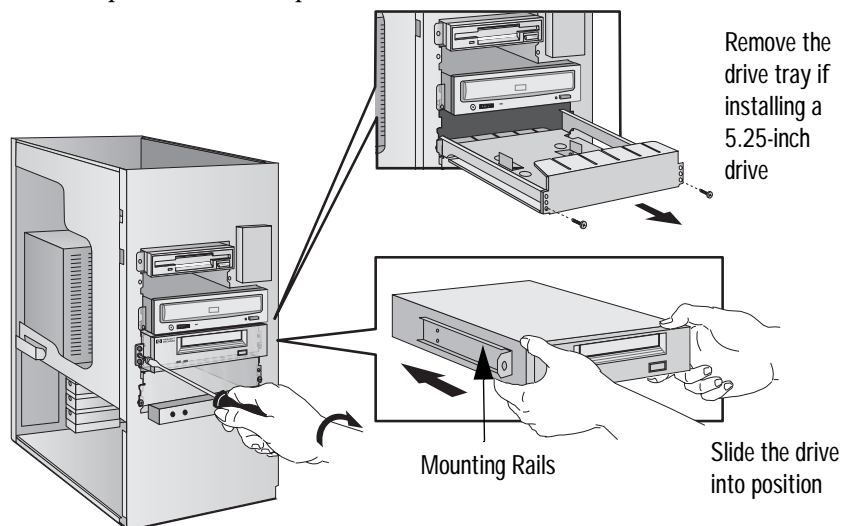
Before Installing an
IDE Device

Refer to the drive's installation guide to see if you must set jumpers or if there is a special installation procedure to follow.

Before Installing a
SCSI Device

If you are installing a SCSI device, refer to the section "Before Installing a SCSI Hard Disk" on page 40 before using the following instructions.

- 1 Disconnect the computer's power cord and any telecommunications cable.
- 2 Remove the computer's cover (see page 25).
- 3 Slide out the power supply to provide better access to the disk drive cables (see page 29).
- 4 If installing a drive in a 5.25-inch wide shelf, remove the drive tray and put it in a safe place.

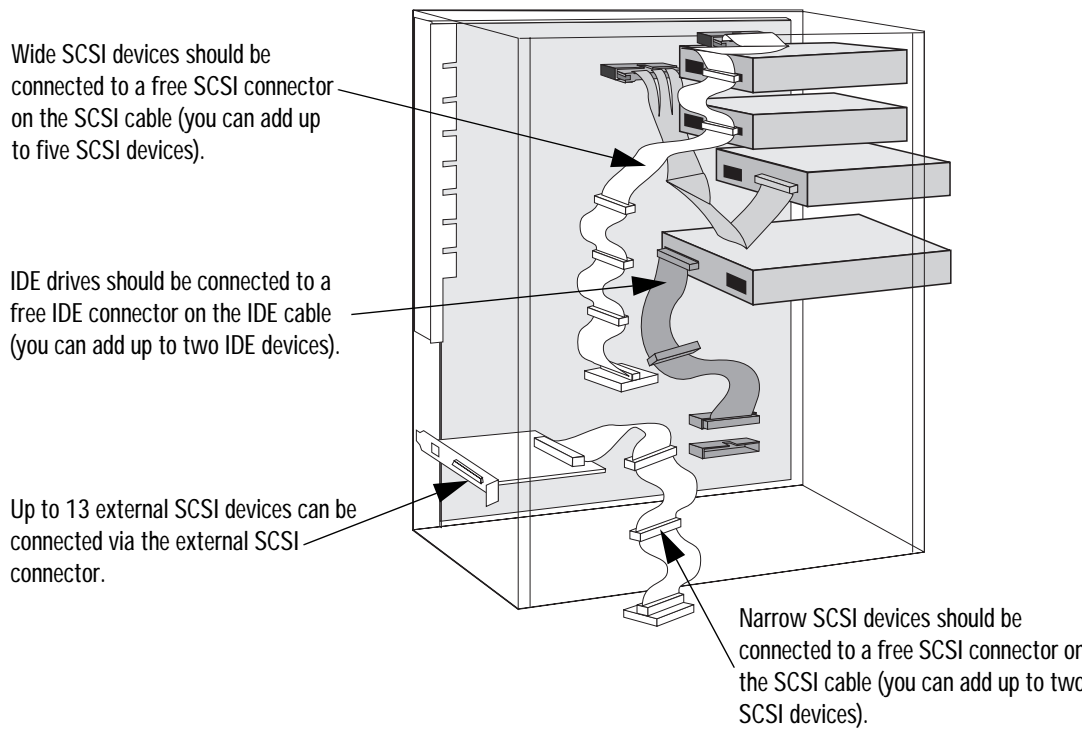


- 5 Slide the drive into the shelf.
- 6 Secure the drive in position using the screws provided with the drive.

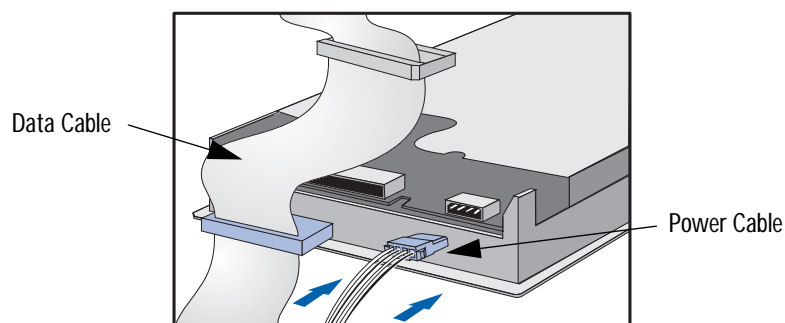
2 How to Install Accessories Inside Your PC Workstation

Installing Mass Storage Devices

7 Locate the appropriate data cable for the device.



8 Connect the data and power cables to the rear of the device. (*The connectors are shaped to go in one way only.*)

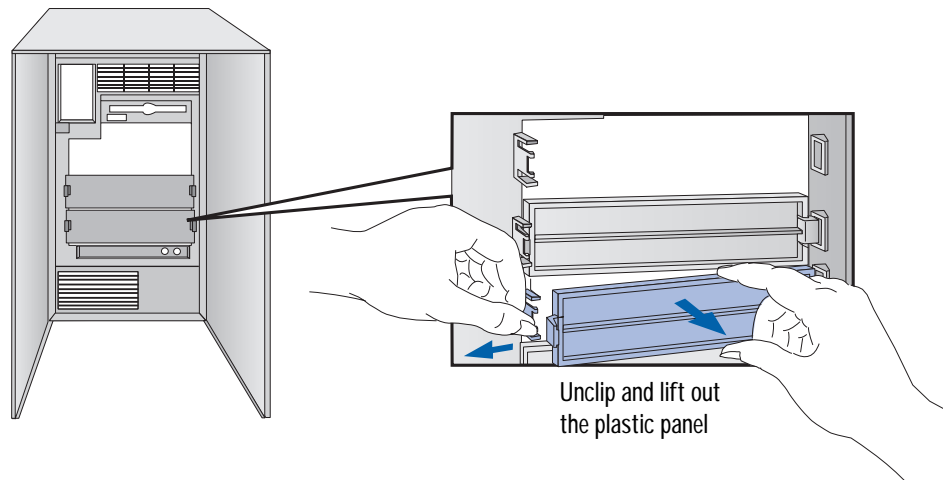


9 Slide the power supply back into position, and tighten the four self-retaining screws (see page 30).

2 How to Install Accessories Inside Your PC Workstation

Installing Mass Storage Devices

- 10 Remove the plastic panel from the cover by pulling the panel from the left and unhinging its right-hand side. Store the panel in a safe place.



- 11 Install any other accessories before replacing the cover and completing the installation.

Completing the Installation of a Drive

When an IDE CD-ROM Drive Is Installed

- 1 Switch on the computer and press **(F2)** when **(F2) Setup** appears.
- 2 In the *Setup* program, select the Advanced menu, the IDE Devices submenu. Check that the CD-ROM drive has been detected on the IDE channel.
- 3 Press **(F3)** to save and exit the program.

When a Flexible Disk Drive Is Installed

- 1 Switch on the computer and press **(F2)** when **(F2) Setup** appears.
- 2 In the *Setup* program, select the Advanced menu, the Flexible Disk Drives submenu, and check that the drive has been detected.
- 3 Press **(F3)** to save and exit the program.

2 How to Install Accessories Inside Your PC Workstation

Installing Accessory Boards

CAUTION

Static electricity can damage electronic components. Turn OFF all equipment. Don't let your clothes touch the accessory. To equalize the static electricity, rest the accessory bag on top of the computer while you are removing the accessory from the bag. Handle the accessory as little as possible and with care.

The PC Workstation has the following accessory board slots:

- Slot AT 2 (the bottom slot) for full-length 16-bit ISA boards
- Slot AT 1/PCI 4 for either a 16-bit ISA board or a full-length 32-bit PCI board
- Slot PCI 3 can be used for a full-length 32-bit PCI board (and also features the RAIDport™ connector)
- Slot PCI 2 for a full-length 32-bit PCI board
- Slot PCI 1 for a full-length 32-bit PCI board
- Slot AGP for the video adapter board

Installing the Board

- 1 Disconnect the computer's power cord and any LAN connection or telecommunications cable.

NOTE

PCI boards are configured automatically when installed in the PC Workstation.

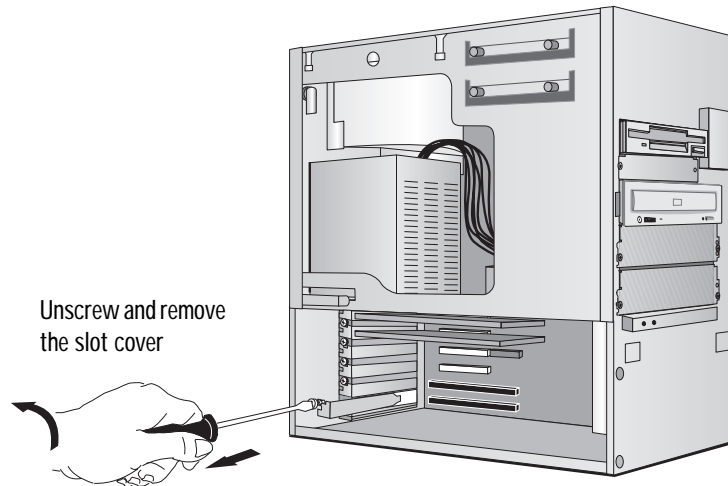
- 2 Remove the computer's cover ("Removing and Replacing the Cover", on page 25) and carefully place the PC Workstation on its side.
- 3 Find an empty slot. refer to "System Connectors and Switches", on page 96. to identify the location of the slot type you want to use (ISA or PCI).

Some boards may have preferred locations and special installation instructions detailed in their manuals.

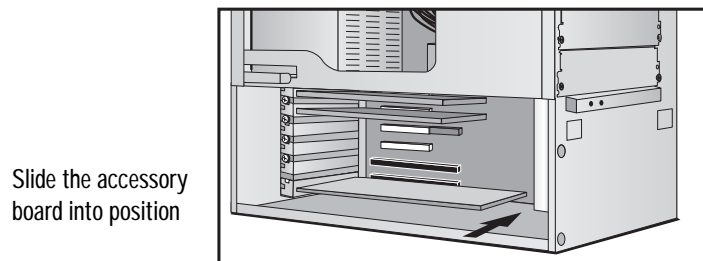
2 How to Install Accessories Inside Your PC Workstation

Installing Accessory Boards

- 4 Unscrew and remove the slot cover. Store it in a safe place.
If the slot cover is tight, loosen the screws on the adjacent slots.



- 5 Hold the board horizontally by its "top" edge. Slide it into the board guide of the chosen slot. Do *not* bend the board.

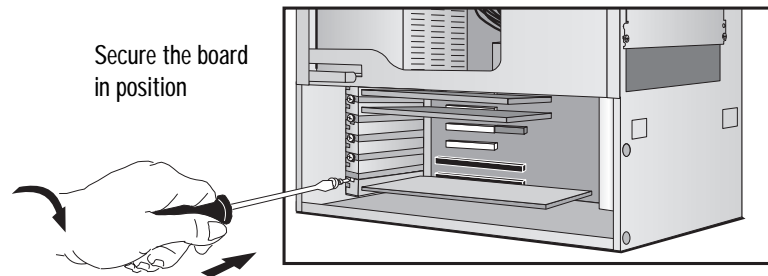


- 6 Align the board's connector with the slot's socket. Firmly press the board into the socket. Ensure the board's connector engages *completely* with the socket and does not touch components on other boards.

2 How to Install Accessories Inside Your PC Workstation

Installing Accessory Boards

- 7 Secure the board by replacing the slot cover screw.
If you loosened the screws on adjacent slots, remember to tighten them.



- 8 Install any other accessories before replacing the cover (see page 27). Reconnect all cables and power cords.

Completing the Installation of an ISA Accessory Board

If you have installed an ISA accessory board that uses any interrupt, you must run the *Setup* program and reserve the IRQ for the accessory board. This allows PCI devices to be automatically configured.

- 1 Turn on the PC Workstation and press **F2** when **F2 Setup** appears.
- 2 In the *Setup* program, select the Advanced menu and the PCI Slot Configuration submenu. A list of IRQs and the devices that use them are displayed. Highlight the IRQ field you want to change, for example **IRQ 11**.
- 3 You can use the space bar or press **F7** or **F8** to make the IRQ available for PCI (**Available**) or make it unavailable for PCI (**Reserved**).
- 4 Press **F3** to save any changes you made and exit the *Setup* program.

NOTE

You should always leave at least one IRQ available for use by the integrated PCI devices.

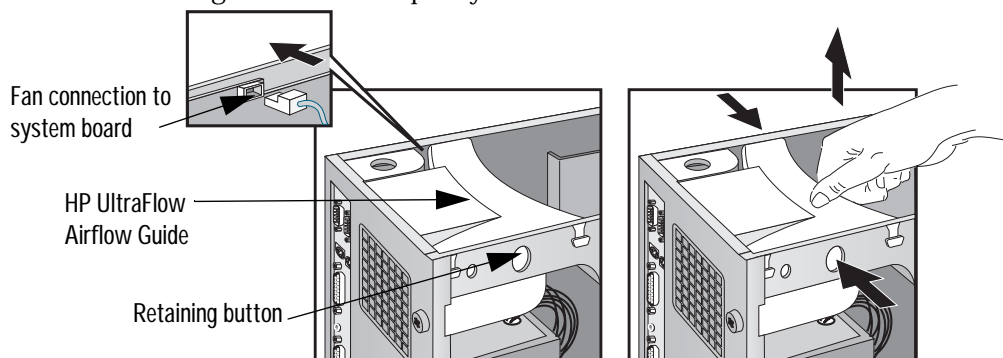
Installing a Processor

Some operating systems support a second processor for enhanced performance. Contact your authorized reseller for up-to-date information.

NOTE

The *Setup* program provides an option to disable the second processor.

- 1 Disconnect the computer's power cord and any LAN or telecommunications cable.
- 2 Remove the computer's cover (see page 25).
- 3 Press the retaining buttons on each side of the HP UltraFlow airflow guide and lift it partly out of the PC Workstation's case.



- 4 Remove the fan connection to the system board and lift the airflow guide completely out of the PC Workstation's case.
- 5 Slide out the power supply to improve access to the processor sockets (see page 29) and carefully place the PC Workstation on its side.
- 6 Remove the transparent airflow guide covering the processor sockets.

2 How to Install Accessories Inside Your PC Workstation

Installing a Processor

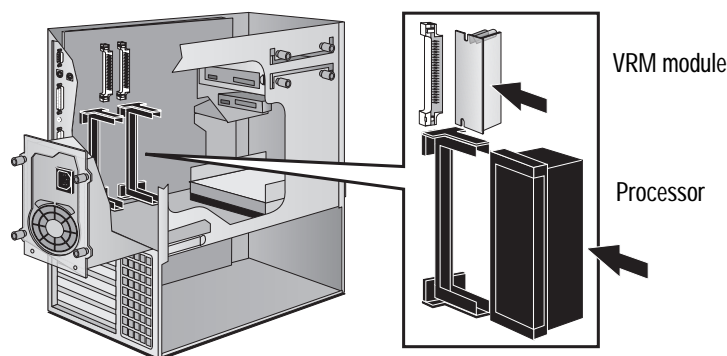
- 7 The system board has two processor sockets and a VRM slot for each processor. If you are changing the existing processor, remove it from the socket by squeezing the tabs at the top and bottom of the processor and gently pulling the processor away from the system board. Then remove the VRM for the processor.

If you are installing a processor in the second socket, remove the terminator.

NOTE

Installing a faster processor than the one supplied with your PC Workstation will void the warranty.

- 8 Slide the new processor into the processor socket and push gently until it snaps into place (*the processor can only go in one way*). If you are installing a second processor, remove the card in the second processor socket and slide the processor into the empty processor socket (next to the existing processor).



- 9 Insert the VRM for the processor in the VRM socket.
- 10 Replace the transparent section of the HP UltraFlow airflow guide covering the processor sockets.
- 11 Slide the power supply back into the computer and tighten the four self-retaining screws.
- 12 Turn the PC Workstation upright and replace the HP UltraFlow airflow guide.
- 13 Reconnect the fan to the system board.

2 How to Install Accessories Inside Your PC Workstation

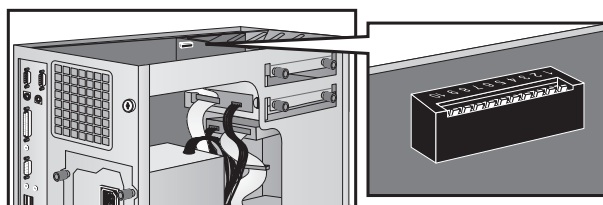
Installing a Processor

Completing the
Installation of a
Processor

- 1 Verify that the system board bus speed switches are correctly configured for the processor.

NOTE

If two processors are installed, both must operate at the same bus speed and processor speed. Refer to the manual supplied with the processor to verify which bus and processor speeds are supported.



Switch 1	Switch 2	Switch 3	Switch 4	Switch 5	External Bus Speed	Processor Speed
UP ¹	UP	UP	DOWN	DOWN	100 MHz	350 MHz
UP	UP	DOWN	UP	UP	100 MHz	400 MHz
UP	UP	DOWN	UP	DOWN	100 MHz	450 MHz
UP	UP	DOWN	DOWN	UP	100 MHz	500 MHz

1. UP=OFF, DOWN=ON.

- 2 Install any other accessories before completing the installation of the processor.
- 3 Replace the cover (see page 27).
- 4 Turn on the computer and check that the new processor is recognized by the power-on system-test.

NOTE

To fully benefit from dual processing, you will need to re-install Windows NT 4.0 on your PC Workstation.

2 How to Install Accessories Inside Your PC Workstation

Installing a Processor

3

Troubleshooting Your PC Workstation

This chapter deals with problems you may encounter when using your PC Workstation.

3 Troubleshooting Your PC Workstation

Solving Problems

Solving Problems

This chapter can help you solve most problems you might have with your PC Workstation.

If you are unable to solve your problem after following the advice in this chapter, refer to "Hewlett Packard Support and Information Services", on page 139.

HP Summary Screen

The HP Summary Screen provides information about your PC Workstation's current configuration. To view the Summary Screen, press **[Esc]** just after your PC Workstation is turned on and while the logo is displayed during the Power-on-Self-Test (POST). Refer to page 101 for more information.

HP Diagnostics

Using HP MaxiLife to Diagnose Problems

You can use HP MaxiLife to help you diagnose problems with your PC Workstation. For more information on using HP MaxiLife, refer to "Using HP MaxiLife to Diagnose Problems", on page 75.

Your HP Hardware Diagnostics Utility

A HP Diagnostics utility is either preloaded on your hard disk drive or is available on the World-Wide-Web.

With this utility you can diagnose hardware-related problems that may arise with your PC Workstation. For more information, "HP Hardware Diagnostics Utility" on page 79.

HP Visualize FX4 Diagnostics Tool

You can use this diagnostics tool, available on the driver's CD-ROM, to help you diagnose problems with your HP Visualize FX4 graphics solution.

Note that this diagnostics tool can only be used with Windows NT.

If Your PC Workstation Does Not Start Properly

Use this section if your PC Workstation does not start properly when you turn it on, and you experience one of the following symptoms:

- Your PC Workstation's display is blank and there are no error messages.
- You cannot change any values in the *Setup* program.
- A POST error message is displayed.
- An error message and an (:-) icon appears on the LCD screen (refer to "Using HP MaxiLife to Diagnose Problems" on page 75).

Display is Blank and There Are No Error Messages

If your display is blank and there are no error messages when you turn on your PC Workstation, follow this procedure:

- 1 Check the LCD screen (refer to "Using HP MaxiLife to Diagnose Problems" on page 75).
- 2 Check external items.
- 3 Check internal items.
- 4 Rebuild your PC Workstation's components (see page 61).

Check External Items

Be sure the following external items are functioning properly:

- Check that the computer and display are turned on. (The power light should be illuminated.)
- Check the display's contrast and brightness settings.
- Make sure that all cables and power cords are firmly plugged in.
- Make sure the power outlet is working.

3 Troubleshooting Your PC Workstation

If Your PC Workstation Does Not Start Properly

Check Internal Items If the PC Workstation still does not start properly, follow this procedure to check the internal items:

- 1 Turn off the display, the computer, and all external devices.
- 2 Unplug all power cords and cables, noting their positions. Disconnect the PC Workstation from any telecommunications network.
- 3 Remove the cover.
- 4 Check the following items:

LCD Error Messages	Action	Reference
-	Check all internal cables.	Ensure they are correctly attached and firmly in place.
Power CPU 1 Power CPU 2	Check that the processor and VRM are correctly installed.	Refer to "Installing a Processor" page 53.
CPU Freq	Check that the processor speed switches have been set correctly.	Refer to "System Board Switches" page 99.
CPU error	Reset the PC Workstation or power-off the LAN.	Refer to "Your PC Workstation's Hardware Control Panel" on page 9.
-	Check that the memory modules are correctly installed.	Refer to "Installing Memory" page 31.
-	Check that accessory boards are firmly seated in their slots.	Refer to "Installing Accessory Boards" page 50.
-	Verify that any switches and jumpers on the accessory boards are properly set.	Refer to the manuals that came with each board.
-	Check that the switches on the system board are properly set.	Refer to "System Board Switches" page 99.
Temp disk Temp CPU Temp IO slot	Check fans and that air flow guide is not blocked.	Refer to the illustration on page 29.
Fan CPU Fan disk Fan IO slot	Check that fans are installed correctly.	Refer to the illustration on page 29.
Power supply	Check that power supply is properly connected.	Refer to "Replacing the Power Supply after Installing Accessories" on page 30

3 Troubleshooting Your PC Workstation

If Your PC Workstation Does Not Start Properly

Rebuild Your PC Workstation's Components

- 5 Replace the cover.
- 6 Reconnect all cables and power cords.
- 7 Turn on the display and computer.

If your PC Workstation still does not start properly, remove all boards and accessories, except the hard disk drive and video board. Start the PC Workstation. If the PC Workstation now works, add the boards and accessories one at a time to determine which one is causing the problem.

If you are Unable to Change any Values in *Setup*

Ensure that you are using the correct password.

If a POST Error Message is Displayed

The Power-On-System-Test (POST) can detect both an error and a change to the configuration. In either case, an error code and short description is displayed. Depending on the kind of error, you will have one or more of these choices available on screen:

- Press **[F1]** to ignore the message and continue.
- Press **[F2]** to run *Setup* and correct a system configuration *error*. HP recommends that you correct the error before proceeding, even if the PC Workstation appears to start successfully.
- Press **[F4]** to accept (validate) the change and update *Setup's* configuration information.
- Press **[Enter]** to see more details about the message. After viewing these details, you will be returned to the original POST display screen. If the message is actually a change to the configuration you have made (for example, you have just removed some memory), you can then press **[F4]** to accept the change and update *Setup's* configuration information. Otherwise, press **[F1]** to ignore the message and continue, or press **[F2]** to run *Setup* and correct a system configuration error. (The number of choices you will have available are dependent on the kind of error.)

3 Troubleshooting Your PC Workstation

If Your PC Workstation Does Not Start Properly

Clearing the PC Workstation's Configuration Memory

If the PC Workstation then starts, but POST still persists in reporting an error, clear the current configuration memory values and reinstall the built-in default values:

- 1 Turn off the PC Workstation, disconnect the power and cables, and remove the cover. Disconnect the PC Workstation from any telecommunications network.
 - a Set the system board switch 6 (CLEAR CMOS) DOWN to clear the configuration.
 - b Replace the cover, and reconnect only the power cable.
 - c Turn on the PC Workstation. This will erase the CMOS memory.
 - d Wait until the PC Workstation has started. A message will be displayed similar to this:
"Configuration has been cleared, set switch Clear CMOS to the open position before rebooting."
 - e Turn off the PC Workstation, disconnect the power cable, and remove the cover.
 - f Set the system board switch 6 (CLEAR CMOS) UP to retain the configuration.
- 2 Replace the cover, and reconnect the power and cables.
- 3 Switch on the PC Workstation. An error message will be displayed similar to the following:

On your monitor:

On your PC Workstation's LCD:

Incorrect PC Configuration Error! POST 0012

The PC Workstation will stop. Press (to view the system errors) and then press .

- 4 Run *Setup* by pressing . CMOS default values will be automatically downloaded and saved.
- 5 Make any other changes you want and press to save the configuration and exit from *Setup*.

If You Cannot Turn Off Your PC Workstation

Use this section if you cannot turn off your PC Workstation, the power indication light is red, and you hear a “buzzing” sound.

- Check if your PC Workstation is locked, whereby “power-off” is not allowed. You will need to enter a password to unlock the PC Workstation (refer to “Setting Passwords” on page 18 for more information).
- Check if you are in a suspend/standby mode, in which case a “power-off” would risk a loss of information/data (refer to the Power Menu in the HP *Setup* program).

CAUTION

If you press the On/Off button for four seconds, the system will be automatically turned off. Note that this does not shut down the operating system properly.

3 Troubleshooting Your PC Workstation
If Your PC Workstation Has a Hardware Problem

If Your PC Workstation Has a Hardware Problem

This section describes what to do if you have problems with your display, disk drives, printer, accessory boards, keyboard, or mouse.

Display Does Not Work Properly

If Your Display Is
Blurred or Unreadable

If you have selected the wrong display type in your operating system, the display screen may become blurred or unreadable. To correct this problem, select the correct display by using the procedures in the operating system on your PC Workstation. Refer to your PC Workstation's operating system documentation for details.

If Nothing Is Displayed
On the Screen

If nothing is displayed on the screen, but the PC Workstation starts and the keyboard, disk drives, and other peripheral devices seem to operate properly:

- Check your PC Workstation's LCD screen to help you diagnose the problem. For more information, refer to "Using HP MaxiLife to Diagnose Problems", on page 75.
- Make sure that the display is plugged in and switched ON.
- Check that the brightness and contrast controls are properly set.
- Ensure that the display video cable is correctly connected.
- Switch off the display, and unplug it from the power outlet.
- Disconnect the video cable and examine the video cable connector pins. If the pins are bent, carefully straighten them.
- Check that the video upgrade is properly installed if you have one.
- If the display works correctly during the Power-On-Self-Test (POST), but goes blank when Windows starts, check that you have enough memory for the video mode you have selected. Boot the operating system in VGA mode (available with some systems).
- If your screen's refresh rate is set too high, the screen might be blank. Check the refresh settings to ensure they are not too high.

3 Troubleshooting Your PC Workstation If Your PC Workstation Has a Hardware Problem

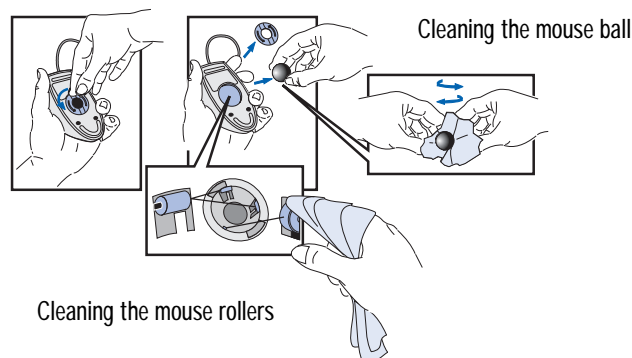
Other Display Problems If the display image is not aligned with the screen, use the display's controls to center the image (refer to the display manual for instructions). If the screens generated by the applications do not appear to be correct, check the application's manual to find out which video standard is required. Also check your display manual to find out which refresh rate is required. Use your operating system's procedures, to select the correct refresh rate.

If Your Keyboard Does Not Work

- Ensure that the keyboard is correctly connected (a keyboard icon will be displayed on your screen if the keyboard is not connected).
- If you turn on your PC Workstation, the operating system boots, and the keyboard is correctly connected but still not available, the power-on password may be set to "keyboard locked". You will need to enter a password to unlock the keyboard and mouse. You can change this setting in the *Setup* program. Refer to the Power Menu in the HP *Setup* program.

If Your Mouse Does Not Work

- Ensure that the mouse is correctly connected.
- Ensure that the mouse driver supplied with the preloaded software is installed correctly.
- Clean the mouse ball and rollers as shown in the figure below (use a non-residual contact cleaner).



3 Troubleshooting Your PC Workstation

If Your PC Workstation Has a Hardware Problem

If Your Printer Does Not Work

- Make sure the printer's power switch is ON.
- Verify that the power cord is plugged into the power outlet and the printer.
- Verify that you have the correct cable for the printer. Make sure that it is securely connected to the correct connector (port) on the PC Workstation and printer.
- Check that the printer is online.
- Examine the paper feed mechanism for a paper jam.
- Make sure that the printer is configured correctly for the PC Workstation and for the application.
 - a Ensure the PC Workstation's port has been correctly configured using *Setup*.
 - b Make sure the printer is correctly set up in your operating system's configuration.
 - c Ensure the application program's "print" menu has been correctly set up. (Refer to the manual supplied with the application software.)
- Check that the PC Workstation's port is working properly by running another peripheral connected to the port.
- If you receive an error message, refer to the printer's manual for help.

If the Flexible Disk Drive Does Not Work

- Check that you are using a formatted diskette and it is inserted correctly.
- Check you are using a diskette that is the correct density.
- Check that the flexible disk drive is correctly configured in the *Setup* program (Advanced > Flexible Disk Drive).
- Check that the flexible disk drive is not disabled in the *Setup* program (Advanced > Flexible Disk Drive).

3 Troubleshooting Your PC Workstation
If Your PC Workstation Has a Hardware Problem

- Check that the Flexible Disks item and the Write on Flexible Disks item are not set to locked in the *Setup* program (Security > Hardware Protection).
- Clean the flexible disk drive using a diskette cleaning kit.
- Check that the disk power and data cables are correctly connected.

If the Hard Disk Drive Does not Work

- Check that the disk power and data cables are correctly connected (Refer to "Connecting Devices" on page 37).
- For an IDE drive, check the IDE Device's configuration settings in the *Setup* program (Advanced > IDE Devices).
- For an IDE drive, check the Hardware Protection settings in the *Setup* program (Security > Hardware Protection).
- For an IDE drive, check the Boot Device Security settings in the *Setup* program (Security > Boot Devices Security).
- For a SCSI drive, check the SCSI Interface settings in the *Setup* program at Advanced > Internal Wide 16-bit SCSI or External\Internal 16\8-bit SCSI and in the *SCSISelect* Utility (Adaptec) or the Configure SCSI Utility (Symbios).

If the Hard Disk Activity
Light Does Not Work

If the hard disk activity light does not flicker when the PC Workstation is accessing the hard disk drive:

- Check that the control panel connector is firmly attached to the system board.
- Check that the disk power and data cables are correctly connected.

3 Troubleshooting Your PC Workstation
If Your PC Workstation Has a Hardware Problem

If the CD-ROM Drive Has a Problem

WARNING

Be sure to disconnect the power cord and any telecommunication cables from your computer before you remove the cover to check the cable connections or jumper settings.

To avoid electric shock and harm to your eyes by laser light, do not open the CD-ROM drive enclosure. The drive should be serviced by qualified service personnel only. Refer to the label on the drive for power requirements and wavelength. Do not attempt to make any adjustment to the unit. This PC Workstation is a class 1 laser product.

The CD-ROM Drive Does not Work

- Check that the cables have been properly connected.
- Check that the CD-ROM is inserted in the drive.
- Check the IDE Devices configuration settings in the *Setup* program (Advanced > IDE Devices).
- Check the Hardware Protection settings in the *Setup* program (Security > Hardware Protection).
- Check the Boot Device Security settings in the *Setup* program (Security > Boot Devices Security).
- Check that the Integrated Bus IDE Adapters item is set to Both in the *Setup* program (Advanced > IDE Devices).

3 Troubleshooting Your PC Workstation If Your PC Workstation Has a Hardware Problem

No Sound from the CD-ROM Drive

If you are having problems with sound when playing a CD:

- Check that the volume control (if present) on the CD-ROM or CD-RW drive front panel is not set to the minimum.
- Ensure that the disk in the drive is an audio disk and not a photo CD or data CD.
- If using headphones or external speakers, check that they are properly connected to the Audio Front Panel (not to the audio jack for the CD-ROM).
- Check that the CD Audio switch is selected in the mixer (if selected a speaker icon will appear in the taskbar).
- Check that the CD audio cable is correctly installed and is connected to the system board.

The CD-ROM Drive is Idle

If the drive does not appear to be working, try accessing the disk by clicking on the drive icon or drive letter assigned to the drive by your operating system.

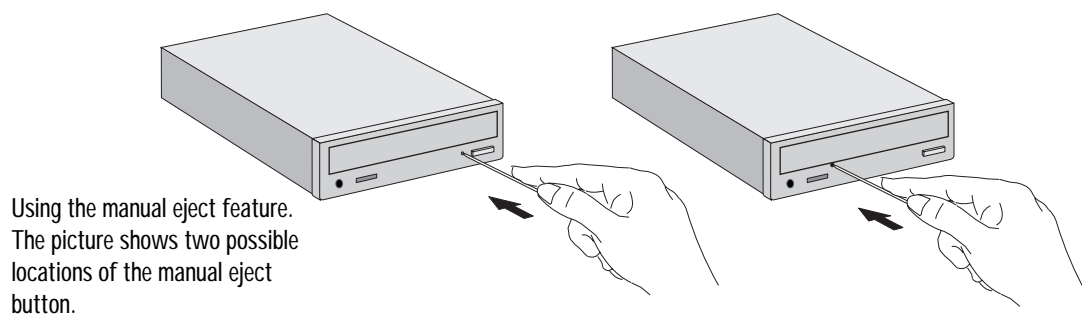
3 Troubleshooting Your PC Workstation

If Your PC Workstation Has a Hardware Problem

The CD-ROM Drive Does not Open

If you have difficulty removing a CD-ROM disk from the CD-ROM drive (during a power failure for example), you can use the manual eject button. To eject a CD-ROM disk using the manual eject button, proceed as follows:

- 1 If the CD-ROM drive manual eject button is not visible, remove the front bezel covering the drive. The manual eject button is inside a small hole in the front of the CD-ROM drive.
- 2 With a thin, solid rod, such as the end of a paper clip, push the drive's manual eject button.



- 3 The drive door is released, opening slightly. Carefully pull it open fully and retrieve the disk.
- 4 To close the drive door, push it gently closed without forcing it. The drive door may not close completely until it is fully functional (for example, when the power comes back on).
- 5 If required, replace the drive's front bezel.

If an Accessory Board Does not Work

Carry out the following checks:

- Check that the accessory board has been firmly installed in the slot.
- Check that the accessory board has been correctly configured.
- Check that the accessory board is not using memory, I/O addresses, an IRQ, or DMA also used by the PC Workstation. Refer to “IRQs, DMAs, and I/O Addresses Used by Your PC Workstation” on page 86 for more information.

3 Troubleshooting Your PC Workstation
If Your PC Workstation Has a Software Problem

If Your PC Workstation Has a Software Problem

If You Have Forgotten Your Password

☐ If you forget the User Password and the Administrator password is set and known:

- 1 Switch off the PC Workstation.
- 2 Restart the PC Workstation.
- 3 Wait for the message **(F2) Setup**.
- 4 Press **(F2)** to start *Setup*.
- 5 Type the Administrator password to enter *Setup*.
- 6 Select Security, the User Password submenu, and set a new User password.
- 7 Press **(F3)** to save the new User password and exit *Setup*.

☐ If you forget both the User password and the Administrator password:

- 1 Switch off the PC Workstation and remove the computer's cover (refer to page 25).
- 2 Set switch 7 (PSWRD) on the system board switch block to ON (DOWN). Refer to page 99 for the switch location.
- 3 Replace the PC Workstation's cover and switch on the PC Workstation. Allow it to complete its startup routine.
- 4 Switch off the PC Workstation and remove the cover.
- 5 Reset switch 7 (PSWRD) to OFF (UP).
- 6 Replace the computer's cover (refer to page 27).
- 7 Switch on the PC Workstation and allow it to startup.
- 8 Press **(F2)** when prompted to use *Setup*.
- 9 Set new User and Administrator passwords.
- 10 Press **(F3)** to save the new passwords and exit *Setup*.

If You Can't Start the *Setup* Program

This may happen if the copy of the PC Workstation's configuration stored in memory is corrupted. You will need to erase this bad configuration. Refer to "Clearing the PC Workstation's Configuration Memory" on page 62 for more information on how to do this.

If the Date and Time Are Incorrect

The date and time can be incorrect for the following reasons:

- The time has changed to reflect the beginning or end of Summer Time
- The PC Workstation has been unplugged from the mains for too long and the battery is discharged.

The on-board battery automatically recharges itself as soon as the PC Workstation is plugged into a power outlet.

To change the date and time, use your operating system utilities or the *Setup* program.

If Your Application Software Does Not Work

If the PC Workstation reports the system is OK and the indicator light over the power switch is illuminated, but some software won't run, refer to the operating system and/or application software manuals.

If You Have a Network Problem

If you have a problem with your PC Workstation's network, run the HPIEDIAG utility provided on the HP CD-ROM that contains the LAN drivers, supplied with your PC Workstation. This utility should be run from a minimal DOS system, without any LAN drivers loaded—achieve this by booting from a system floppy disk. (If your PC Workstation is running Windows NT 4.0, you will need to create this system floppy disk on another PC.)

- 1 Insert the system floppy disk in the floppy disk drive and re-boot your PC Workstation.

3 Troubleshooting Your PC Workstation

If Your PC Workstation Has a Software Problem

- 2 Insert the CD-ROM containing the HPIEDIAG utility in the CD-ROM drive.
- 3 Make the CD-ROM drive the current drive by typing, for example, **D:** if D is the letter of your CD-ROM drive.
- 4 Change to the DIAG directory by typing: **CD\LAN\DIAG** .
- 5 Start the HPIEDIAG utility by typing: **HPIEDIAG** . Follow the instructions on the screen.

Then check the configuration of the integrated Ethernet interface using the *Setup* program. Refer also to the *Network Administrator's Guide* preloaded onto your PC Workstation.

If Your PC Workstation Has an Audio Problem

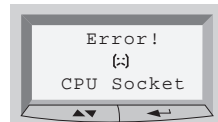
If you encounter problems with the audio on your PC Workstation, refer to the *Using Sound* guide preloaded onto your PC Workstation.

Using HP MaxiLife to Diagnose Problems

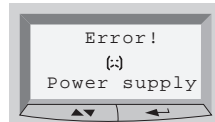
Your HP LCD can help you to diagnose problems with your PC Workstation, even when you are unable to get your system and monitor working properly.

Pre-Boot Checks

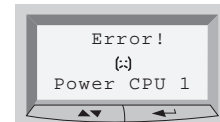
When you press your PC Workstation's on/off button, HP MaxiLife will check your system before it initiates the start-up sequence. You will see one of the following screens on the LCD as these checks progress:



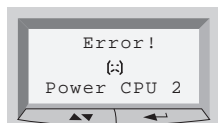
Check that a CPU or terminator is installed in the CPU slots



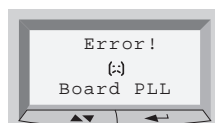
Check power supply and power cable connections.



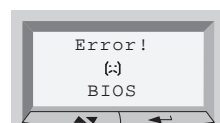
Check processor 1 VRM installation.



Check processor 2 VRM installation.

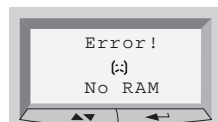


Check system board.

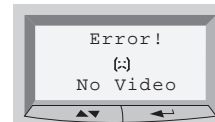


Flash new BIOS.

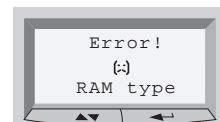
Note: Some error messages displayed here may not be available.



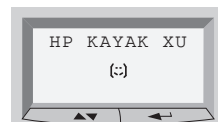
Check memory installation.



Check that graphics card is installed correctly.



Check that installed RAM types are compatible.



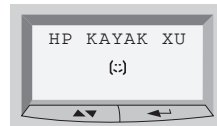
No errors occurred during pre-boot. POST is initiated.

3 Troubleshooting Your PC Workstation

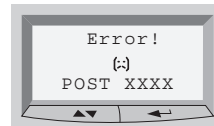
Using HP MaxiLife to Diagnose Problems

POST Phase

Following these checks, the POST (Power-On Self Test) sequence is initiated. One of the following screens will appear in this phase:



No errors occurred.



A POST error occurred. Refer to "If a POST Error Message is Displayed" on page 61 for more information.

Other Features

HP MaxiLife can also be configured to:

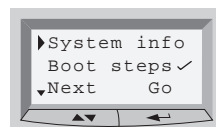
- Display the configuration details of your PC Workstation required to obtain support (*System info.*)
- Indicate POST (Power-On Self Test) steps during the power-on phase (*Boot steps*)
- Perform diagnostic tests on your PC Workstation's various hardware components and display the results (*Diags*).



To configure your HP LCD:

- 1 Ensure that your PC Workstation's power cord is connected to a grounded outlet.

In this state, your PC Workstation's hardware management chip is active, even if your system is not powered on.

- 2 Press one of the LCD control buttons. The following menu is displayed.



- 3 Use  to scroll down through the menu items and  to select the required menu item.

3 Troubleshooting Your PC Workstation

Using HP MaxiLife to Diagnose Problems

System Info.

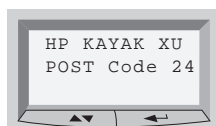
System information is displayed on the LCD one screen at a time and should detail the following:

- Bios version
- Number & speed of processors
- Number and capacity of memory modules installed
- Serial Number

To view these details, use the  button to scroll through the information screens.

Boot Steps

Where available, the *Boot steps* option will display all POST steps the next time your PC Workstation is powered on. For support purposes, POST steps are shown as POST codes and displayed on the LCD as follows:




Post steps will be displayed on the LCD the next time your PC Workstation is powered on.

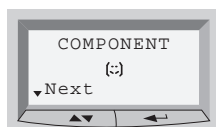
Diags

If your PC Workstation is powered off when *Diags* is selected, the LCD displays a second menu. To perform the diagnostics tests, select **Power on** from this menu to enable the hardware management chip to assess the status of your system's components.

If your PC Workstation is already powered on, the diagnostic tests will be performed as soon as you select *Diags* from the LCD's main menu.

To view the test results for each system component, press the  control button.


If no component errors are detected, the following screen will appear.

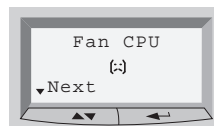
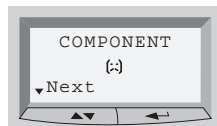


No errors were detected.

3 Troubleshooting Your PC Workstation

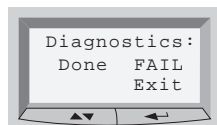
Using HP MaxiLife to Diagnose Problems

If an error is detected, an error screen appears indicating the problem. To continue viewing the test results of the other system components, press the  control button.

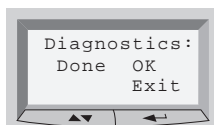


For example, if there is a problem with a fan, an alarm will sound and the following error screen will appear. For more information, refer to "Check Internal Items" on page 60.

When the diagnostic tests are complete, one of the following screens is displayed.



System errors were detected.



No errors were detected.

You can exit the test session by pressing the  button.

HP Hardware Diagnostics Utility

The Hardware Diagnostics utility helps you to diagnose hardware-related problems on HP PCs and PC Workstations. It is a series of tools designed to help you to:

- Check the configuration of your system and verify that it is functioning correctly.
- Diagnose hardware-related problems.
- Provide precise information to HP-dedicated Support Agents so that they can solve any problems quickly and effectively.

Installing this Utility

PC users must first install the latest version of this utility and then ensure it is ready for use.

For more information about how and where to install this utility, refer to the Vectra\Kayak Hardware Diagnostics *User's Guide*, available on the HP World Wide Web Site in PDF (Adobe Acrobat) format.

It is important that you use the latest version of this utility to diagnose hardware-related problems. If you do not, HP-dedicated Support Agents may request that you do so before offering support.

The latest version of this utility can be obtained from HP Electronic Information Services, available 24 hours per day, 7 days per week.

To access these services you should connect to the HP World Wide Web Site at **<http://www.hp.com/go/kayaksupport/>**

3 Troubleshooting Your PC Workstation

HP Hardware Diagnostics Utility

Starting This Diagnostics Utility

To start the Hardware Diagnostics utility:

- 1 Quit all applications, shut down the operating system and restart your PC.
 - a If you are going to run this utility from a diskette, insert it into the flexible disk drive before you restart the PC. On restarting, this utility will run automatically, displaying the Welcome screen.
 - b If you are going to run this utility from your hard disk drive, the PC will restart with the option to choose between your usual operating system and this utility. Select the Vectra\Kayak Hardware Diagnostics option and it will start automatically, displaying the Welcome screen.
- 2 Press F2 to continue and follow the instructions on-screen to carry out the diagnostic tests.

This utility will automatically detect the complete hardware configuration of your system before any tests can be performed.

Basic System Tests

To verify the correct operation of your system's hardware, you will need to carry out the Basic System Tests.

Advanced System Tests

To perform more in-depth testing of your system's individual components, you will need to carry out the Advanced System Tests.

NOTE

The advanced test phase of this utility is suitable for intermediate and advanced users only.

Support Ticket

To produce a complete record of your system's configuration and test results, you will need to create a Support Ticket. This can then be sent, via email or fax, to your local or HP-dedicated Support Agent.

For more information on how to use this utility, refer to the Vectra\Kayak Hardware Diagnostics *User's Guide*, available on the HP World Wide Web Site, at **<http://www.hp.com./go/kayaksupport/>**

4

Technical Information

This chapter provides technical information about your PC Workstation and includes information on the HP *Setup* program.

4 Technical Information

Features

Features

Feature:	Description:				
Processor (standard)	Pentium II (single or dual)				
Cache Memory (integrated in processor package)	<ul style="list-style-type: none"> Level-One: 16 KB code, 16 KB data Level-Two: 512 KB 				
Main memory (size/speed)	Upgradeable to 1 GB (SDRAM) using either: <ul style="list-style-type: none"> 64 MB or 128 MB 100 MHz Non-Buffered ECC SDRAM, or 256 MB Registered ECC SDRAM memory modules 				
Video	<table border="0"> <tr> <td>XU Models</td><td>Matrox 2D Integrated Graphics Accelerator installed on the AGP slot (upgradable to 16 MB)</td></tr> <tr> <td>XW Models</td><td> HP Visualize FX4 OpenGL Accelerator installed on both the AGP and the PCI accessory board slot 18 MB SGRAM Frame Buffer 1 MB EDO DRAM for VGA 16 MB SDRAM Texture Memory (optional) <i>or</i> AccelGraphics AccelEclipse OpenGL Accelerator installed on the AGP slot 15 MB 3DRAM Frame Buffer 16 MB SDRAM Texture Memory 1 MB EDO DRAM for VGA </td></tr> </table>	XU Models	Matrox 2D Integrated Graphics Accelerator installed on the AGP slot (upgradable to 16 MB)	XW Models	HP Visualize FX4 OpenGL Accelerator installed on both the AGP and the PCI accessory board slot 18 MB SGRAM Frame Buffer 1 MB EDO DRAM for VGA 16 MB SDRAM Texture Memory (optional) <i>or</i> AccelGraphics AccelEclipse OpenGL Accelerator installed on the AGP slot 15 MB 3DRAM Frame Buffer 16 MB SDRAM Texture Memory 1 MB EDO DRAM for VGA
XU Models	Matrox 2D Integrated Graphics Accelerator installed on the AGP slot (upgradable to 16 MB)				
XW Models	HP Visualize FX4 OpenGL Accelerator installed on both the AGP and the PCI accessory board slot 18 MB SGRAM Frame Buffer 1 MB EDO DRAM for VGA 16 MB SDRAM Texture Memory (optional) <i>or</i> AccelGraphics AccelEclipse OpenGL Accelerator installed on the AGP slot 15 MB 3DRAM Frame Buffer 16 MB SDRAM Texture Memory 1 MB EDO DRAM for VGA				
LAN	Ethernet 10BT/100TX LAN controller on PCI accessory board (combined LAN/SCSI board).				
Audio	Integrated 16-bit high fidelity with high-end mixing capability and SigmaDelta converters				
Disk drive controller	An integrated Ultra 16-bit SCSI controller, An Ultra ATA-33 IDE controller, and An Ultra SCSI 16-bit interface board (combined with the LAN)				

4 Technical Information

Features

Feature:	Description:
Rear connectors	<ul style="list-style-type: none"> • Mini-DIN mouse • Mini-DIN keyboard • 25-pin parallel • 9-pin serial (two, buffered) • Two USB connectors • Joystick/Dual MIDI connector • LINE IN jack (3.5 mm) • LINE OUT jack (3.5 mm) • MIC IN jack (3.5 mm)
25-pin parallel connector	<ul style="list-style-type: none"> • Mode: Centronics or bidirectional modes (ECP/EPP) • Parallel port: 1 (378h, IRQ 7), 2 (278h, IRQ 5), or Off.
9-pin serial connectors	<ul style="list-style-type: none"> • Standard: Two UART 16550 buffered serial ports (both RS-232-C). • Serial Ports A and B: 2F8h (IRQ 3), 2E8h (IRQ 3), 3F8h (IRQ 4), 3E8h (IRQ 4), or Off— (if one port uses 2xxh, the other port must use 3xxh).
Disk drive shelves	<p>Seven mass storage shelves supporting:</p> <ul style="list-style-type: none"> • Two front-access, third-height, 3.5-inch drives • Three front-access, half-height, 5.25-inch drives • Two internal 3.5-inch hard disk drives
System board connectors	<ul style="list-style-type: none"> • One flexible disk drive connector • One ATA/33 IDE connector (for up to two IDE devices) • One Ultra SCSI 16-bit connector (for up to five internal SCSI devices) • One CD-ROM audio connector • AUX connector • Multimedia front panel connector • Front panel MIC connector • Internal speaker connector • One external start connector • External battery connector
Accessory slots	<ul style="list-style-type: none"> • One AGP (Accelerated Graphics Port) slot • Three 32-bit PCI slots (one with an HP RAIDport) • One 16-bit ISA (Industry Standard Architecture) slot • One combination ISA or PCI slot



4 Technical Information

Features

Feature:	Description:
Keyboard/Mouse XU Models: XW Models:	<ul style="list-style-type: none">• HP enhanced keyboard with mini-DIN connector• HP enhanced scrolling mouse with mini-DIN connector• HP three-button mouse with mini-DIN connector
HP UltraFlow cooling system	Cooling system with multiple temperature-regulated fans to optimize cooling
Headset	Stereo headset with microphone



System Specifications

Power Consumption Information

	XUXW Models
Maximum power consumption	260 W
Typical consumption with: <ul style="list-style-type: none">• One processor installed• Two processors installed	approx. 85 W approx. 99 W
Off	2.5 W ¹

1. The power supply in your PC Workstation continues to supply power to the CMOS memory, even when switched off.

NOTE

When the PC Workstation is turned off with the power button on the front panel, the power consumption falls below 5 Watts, but is not zero. The special on/off method used by this PC Workstation considerably extends the lifetime of the power supply. To reach zero power consumption in "off" mode, either unplug the PC Workstation from the power outlet or use a power block with a switch. You should be aware that, in this case, the PC Workstation will lose its time settings within a few days.

Maximum Loads Available for Accessory Slots

The load limits for the ISA and PCI accessory slots are compliant with ISA and PCI specifications. More details of permitted loads are provided on the World Wide Web (refer to "HP World Wide Web Site" on page 144 for access details) in the support documentation section for your PC Workstation.

4 Technical Information

System Specifications

IRQs, DMAs, and I/O Addresses Used by Your PC Workstation

The IRQ, DMA, and I/O address mappings shown here are for a basic configuration. The resources used by your PC Workstation may vary, depending on which accessory boards are bundled with the PC Workstation. Resources are allocated by the system BIOS or the Plug and Play operating system.

IRQs used by PC Workstation	IRQ0	System timer
	IRQ1	Keyboard controller
	IRQ2	Free
	IRQ3	COM2, COM4
	IRQ4	COM1, COM3
	IRQ5	AD1816, LPT2
	IRQ6	Flexible disk drive controller
	IRQ7	LPT1
	IRQ8	Real-time clock
	IRQ9	
	IRQ10	
	IRQ11	AD1816 MIDI
	IRQ12	Mouse
	IRQ13	Not connected
	IRQ14	Integrated IDE controller
	IRQ15	

DMAs used by PC Workstation	DMA 0	Capture
	DMA 1	Playback
	DMA 2	Flexible disk drive controller
	DMA 3	LPT ECP
	DMA 4	Cascade
	DMA 5	free
	DMA 6	free
	DMA 7	free

4 Technical Information

System Specifications

I/O Addresses used by PC Workstation	0000 - 000F	DMA controller 1
	0020 - 0021	Master interrupt controller
	002E - 002F	Configuration registers
	0040 - 0043	Timer 1
	0060, 0064	Keyboard controller
	0061	Port B (speaker, NMI status and control)
	0070	Bit 7: NMI mask register
	0070 - 0071	RTC and CMOS
	0080	Manufacturing port (POST card)
	0081 - 0083, 008F	DMA low page register
	0092	PS/2 reset and Fast A20
	0096 - 0097	Little Ben
	00A0 - 00A1	Slave interrupt controller
	00C0 - 00DF	DMA controller 2
	00F0 - 00FF	Coprocessor error
	0130 - 013F	AD1816 sound system
	0170 - 0177	Free (IDE secondary channel)
	01F0 - 01F7	IDE primary channel
	0200	AD1816 Joystick
	0220 - 0232	AD1816 Sound Blaster
	0278 - 027F	LPT 2
	02E8 - 02EF	Serial port 4 (COM4)
	02F8 - 02FF	Serial port 2 (COM2)
	0330 - 0331	AD1816 MIDI
	0372 - 0377	Free (Secondary flexible disk drive)
	0378 - 037A	LPT1
	0388 - 038B	AD1816 Adlib (FM)
	03B0 - 03DF	VGA
	03E8 - 03EF	COM3
	03F0 - 03F5	Flexible disk drive controller
	03F6	IDE primary channel
	03F7	Flexible disk drive controller
	03F8 - 03FF	COM1
	04D0 - 04D1	Interrupt edge/level control
	0678 - 067B	LPT2 ECP
	0778 - 077B	LPT1 ECP
	0CF8 - 0CFF	PCI configuration space
	8000	PIIX4 Power Management I/O space
	8400	NS317 ACPI Registers
	8800	PIIX4 SMBus I/O space

4 Technical Information

System Specifications

Audio Features

Feature:	Description:
Digitized Sounds	<ul style="list-style-type: none">• Compatible SoundBlaster® Pro Adlib® /OPL3®• 16-bit and 8-bit stereo sampling from 4 kHz to 55.2 kHz• Programmable sample rates with 1 Hz resolution• Full duplex capture and playback at different sample rates• Up to six different simultaneous sample rates• Dual Tune F DMA transfer on channel 0, 1, 2 or 3• Advanced 16-bit software-based real-time audio compression/decompression system with the following standards: PCM, Microsoft ADPCM, SoundBlaster ADPCM in SB mode, CCITT A-Law, CCITT• 16-bit software-based real-time audio compression/decompression system with the following standards: Creative ADPCM (16:4), CCITT A-law (16:8), and CCITT μ-law.• Automatic dynamic filtering for digital audio recording and playback
Music Synthesizer	<ul style="list-style-type: none">• MPU401 compatible MIDI port• Support for Hardware and Software Wave table Synthesizer• Integrated OPL3 compatible music synthesizer
Enhanced Stereo	<ul style="list-style-type: none">• Built-in "Phat Stereo" for enlargement of Stereo Image
Mixer	<ul style="list-style-type: none">• MPC-3 audio mixer• Input mixing sources: MIDI, microphone, LINE IN, CD Audio, AUX Audio, and up to four digitized sounds• Output mixing of all audio sources to the LINE OUT or integrated PC Workstation speaker• Multiple source recording and Left/Right channels mixing• 32-level volume control for microphone, LINE IN, CD Audio, AUX Audio and master volume.• 64-level volume control for digital sounds, wave or PCM data
LINE IN	<ul style="list-style-type: none">• Input impedance: 4 ohms• Input range: 0 to 1Vrms
LINE OUT	<ul style="list-style-type: none">• Stereo output of 5 mW a channel with headphone speakers (impedance > 600 ohms)

4 Technical Information

System Specifications

Feature:	Description:
MIDI/Joystick Interface	<ul style="list-style-type: none">• Built-in MIDI interface for connection to external MIDI devices• Sound Blaster and MPU-401 UART mode compatible• MIDI time-stamp for multimedia extension• Input buffer: 64-byte FIFO• Microsoft Direct Input standard dual joystick port
Audio Front Panel	<ul style="list-style-type: none">• Microphone In jack• Headphone Out jack
Microphone In jack	<ul style="list-style-type: none">• 20 dB gain preamplifier. The boost can be muted with software• 32-level programmable volume control• Input impedance: 600 ohms• Sensitivity: 30 mVpp to 283 mVpp
Headphone Out jack	<ul style="list-style-type: none">• Impedance: 32 ohms

4 Technical Information

System Specifications

Video Features

Resolution and Pixel Depth			
Resolution	Matrox	HP Visualize FX4	AccelEclipse II
640x480	8, 16, 24, 32	8, 24	24
800x600	8, 16, 24, 32	8, 24	24
1024x768	8, 16, 24, 32	8, 24	24
1280x1024	8, 16, 24, 32	8, 24	24
1600x1200	8, 16, 24	8, 24	Not supported.
1920x1080	8, 16, 24	Not supported.	Not supported.
1920x1200	8, 16	Not supported.	Not supported.
1800x1440	8, 16	Not supported.	Not supported.

Maximum Refresh Rates ¹			
Resolution	Matrox	HP Visualize FX4	AccelEclipse II
640x480	200 (Hz)	120 (Hz)	85 (Hz)
800x600	180 (Hz)	120 (Hz)	85 (Hz)
1024x768	140 (Hz)	120 (Hz)	85 (Hz)
1280x1024	110 (Hz)	85 (Hz)	85 (Hz)
1600x1200	90 (Hz)	75 (Hz)	Not supported.
1920x1080	90 (Hz)	Not supported.	Not supported.
1920x1200	90 (Hz)	Not supported.	Not supported.
1800x1440	100 (Hz)	Not supported.	Not supported.

1. Your display may not support the maximum refresh rates shown here. Refer to the *User's Guide* supplied with your display for details of the refresh rates supported by your display.

NOTE

The video drivers and adapter card supplied for your operating system will determine the available video resolutions and the number of displayable colors.

For further information, refer to HP's online Customer Information. To learn how to access this information, see "Using Your HP Enhanced Keyboard" on page 13.

SCSI Features

Feature:	Description:
Dual Controllers	<ul style="list-style-type: none">• Integrated UltraWide 16-bit SCSI Controller• UltraWide 16-bit SCSI Accessory Board Controller
Dedicated Controller	Integrated UltraWide 16-bit SCSI controller dedicated to hard disk drives for full-time top-speed performance
Internal UltraWide 16-bit SCSI (integrated)	<ul style="list-style-type: none">• Based on Adaptec AIC7880 chip• 40 MB per second band width• Supports multiple internal SCSI devices• SCAM support
UltraWide 16-bit SCSI (accessory board)	<ul style="list-style-type: none">• Based on Symbios Logic• 40 MB per second band width• 68-pin 16-bit internal connector (with 16-bit to 8-bit convertor)• 68-pin 16-bit external connector• Automatic switching to non-Ultra for external SCSI devices (20 MB per second)• SCAM support
HP FastRAID	<ul style="list-style-type: none">• Acceleration of Internal UltraWide 16-bit SCSI only• Top performance with two superfast 4.5 GB or 9.1 GB 10,000 rpm hard disks• SCAM not supported

4 Technical Information

System Specifications

Disk Striping Features (FastRAID)

Feature:	Description:
Computer bus	32-bit PCI local bus and HP FastRAID socket connector
Host bus data transfer rate	Up to 133 MB per second
Device protocol	UltraWide 16-bit SCSI
Advanced HP FastRAID features	<ul style="list-style-type: none">• Array status monitoring and event notification• Adjustable stripe width
Device support	Up to 5 HDD/non-HDD SCSI devices per system board channel
Array support	<ul style="list-style-type: none">• Drives can be configured as RAID 0 (with 1 or 2 disk drives) and RAID 1 (with 2 disk drives). With 2 disk drives, both drives should be the same speed (10,000 rpm) and the same capacity (both 14.5 GB or 9.1 GB)• Drives can also be added in non-array environments
Operating system	Windows NT 4.0
Remote management	Windows NT 4.0
SCAM	Not supported; SCSI addresses must be set manually on UltraWide 16-bit SCSI channel

4 Technical Information

System Specifications

Network Features

Feature:	Description:
LAN Controller	AMD PCNET-Fast Chip
RJ45 Connector	10BT/100TX autonegotiation
Remote Boot	Protocols integrated in System BIOS
ExStart Connector	<ul style="list-style-type: none">• Connection to CPU board• LAN Remote Wake Up or Remote Power On signals• Auxiliary power• Hardware Control Panel LAN LED signal
Remote Power On	<ul style="list-style-type: none">• Full remote power on with Magic Packet• Power: Auxiliary power (during power off)
Remote Wake Up	<ul style="list-style-type: none">• Wake Up from Suspend state with Magic Packet• Power: Main power

4 Technical Information
The HP FastRAID Option

The HP FastRAID Option

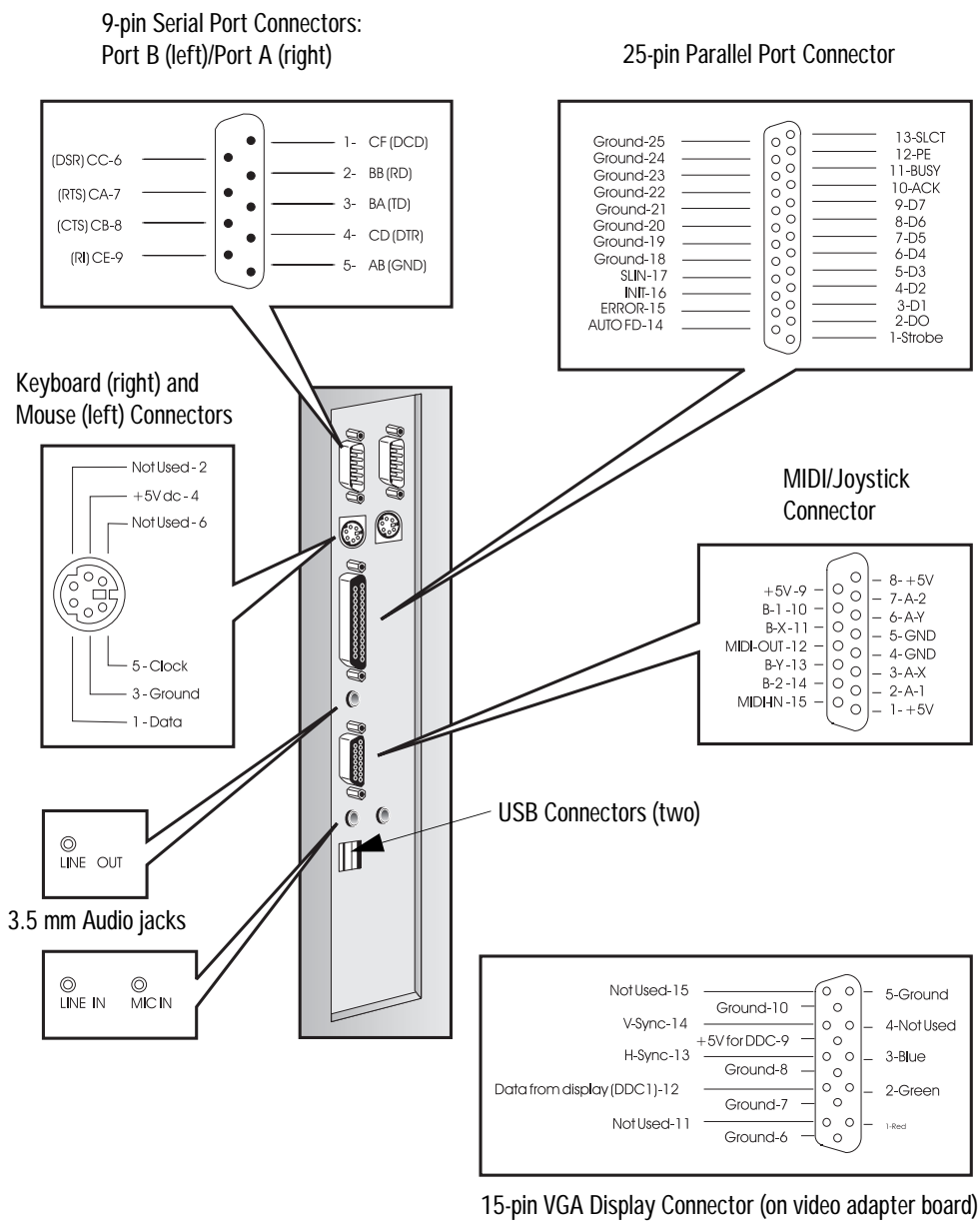
HP FastRAID uses RAID technology to accelerate the performance of your PC's hard drives. Rather than focussing on data protection, as with server-based RAID technologies, HP FastRAID brings top performance to your computer.

If you purchased your computer with the HP FastRAID option, an Adaptec ARO-1130 PCI RAID*port*[™] adapter will have been pre-installed in the RAID*port* connector slot of your PC's system board, and configured to provide maximum I/O throughput for your PC's two hard drives.

Although your ARO-1130 adapter and hard drives come pre-configured for maximum performance (RAID 0), you can also configure the RAID*port* adapter and drives to provide protection against data loss (RAID 1).

To reconfigure your ARO-1130 adapter and hard drives for use with RAID 1, refer to "Using the ArrayConfig Program" on page 122.

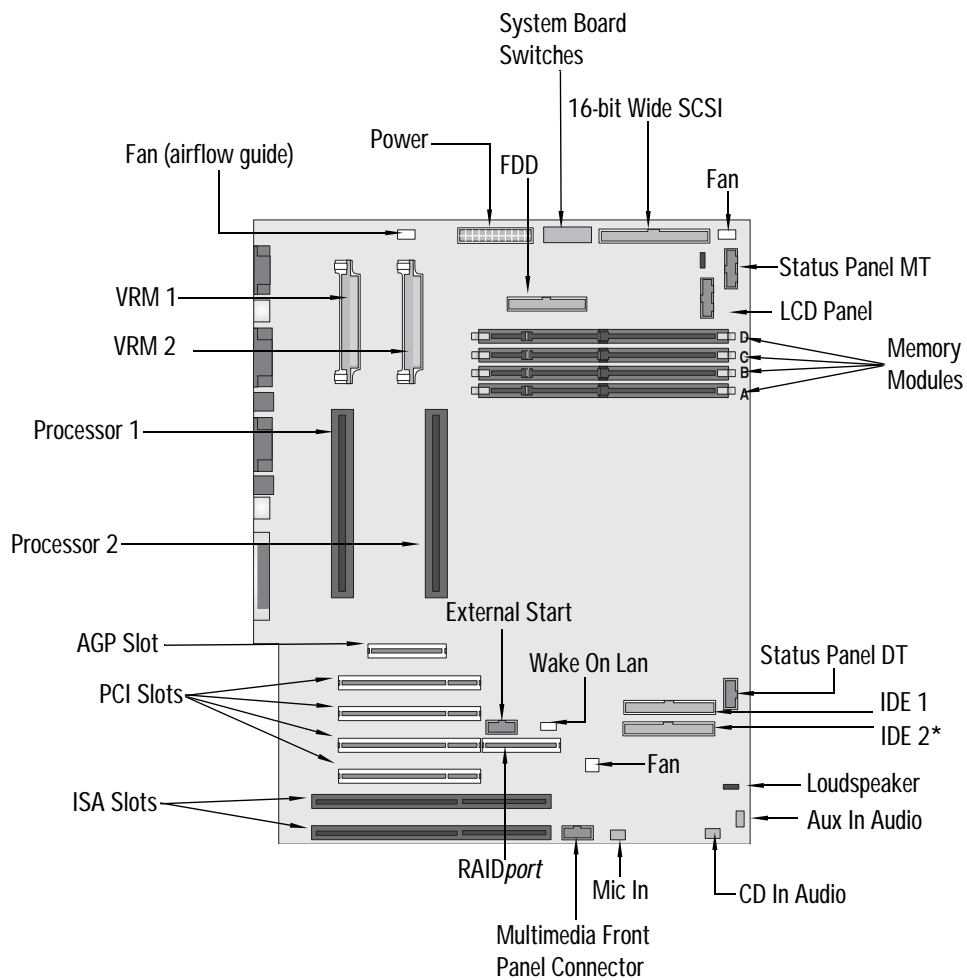
The PC Workstation's Rear Connectors



4 Technical Information System Connectors and Switches

System Connectors and Switches

System Board Connectors



*Selected models only

Internal Audio Connectors

The PC Workstation's system board has several connectors that allow you to internally connect to other devices. This includes:

- A CD audio connector
- An auxiliary (AUX) connector
- An Audio Front Panel connector
- A Front Panel Microphone connector

CD Audio Connector

The CD Audio Connector labeled "CD IN," is a 4-pin connector that is connected to the internal CD drive. This connector allows you to listen to audio from the CD-ROM drive.

The CD Audio Connector has the following pin assignments:

Pin	Signal	I/O
1	Analog Ground	
2	CD right channel	IN
3	Analog Ground	
4	CD left channel	IN

Auxiliary (AUX) Connector

The AUX Connector labeled "AUX IN," is a 4-pin connector that is connected to the internal AUX. This connector allows you to listen to audio from an auxiliary source.

The AUX Connector has the following pin assignments:

Pin	Signal	I/O
1	Analog Ground	
2	AUX right channel	IN
3	Analog Ground	
4	AUX left channel	IN

4 Technical Information

System Connectors and Switches

Audio Front Panel Connector

The Audio Front Panel Connector, labeled “Audio Front Panel,” is a 10-pin connector that links the system board with the multimedia Front Panel. This connector directs stereo output to either the front panel headphone jack or the rear panel stereo jack, as follows:

- When the headphone jack on the Audio Front Panel of the PC Workstation is not being used, the audio signal is available on the rear panel and the internal speakers are active.
- When external speakers are plugged into the rear jack, the audio signal is directed to the rear jack and the internal speakers are muted.
- When a headphone is plugged into the headphone jack, the audio signal is directed to the headphone jack, no sound is available on the rear panel and the internal speakers are muted.

The Audio Front Panel Connector has the following pin assignments:

Pin	Signal	I/O
1	Analog Ground	
2	Key Way	
3	Front Panel input left	IN
4	Front Panel return left	OUT
5	Front Panel input right	IN
6	Front Panel return right	OUT
7	Reserved	
8	Reserved	
9	Reserved	
10	Reserved	

Refer to the online guide *Using Sound*, preloaded on your PC Workstation, for more information about the Audio Front Panel.

4 Technical Information

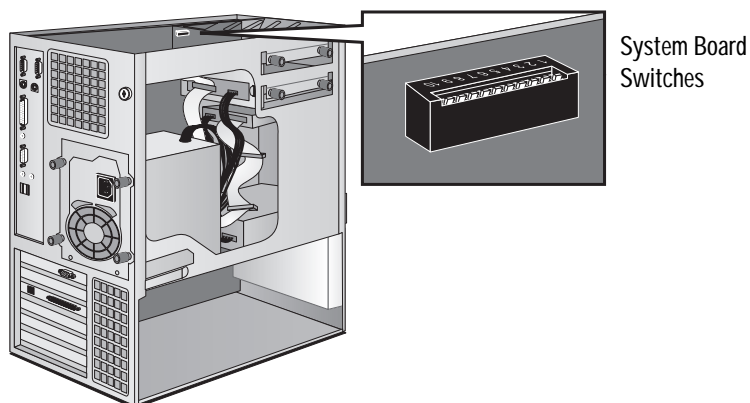
System Connectors and Switches

Front Panel Microphone Connector

The Front Panel Microphone Connector, labeled "Front Panel Micro," is a 3-pin connector. The Audio signal from this connector is directly mixed with the signal from the rear panel Microphone jack. The connector has the following pin assignments:

Pin	Signal	I/O
1	MIC signal + power (tip)	IN
2	Analog Ground	
3	MIC signal + power (ring)	

System Board Switches



Switches 1 through 5 are used for processor settings (see page 55) and should not be changed. Replacing the processor with a different processor is not supported by HP.

Switches 6 to 10 are used as shown in the following table:

4 Technical Information

System Connectors and Switches

Switch ¹	Use Switch to:
6 - CLEAR CMOS	Retain or clear CMOS memory: <ul style="list-style-type: none">• UP to retain CMOS memory — DEFAULT• DOWN to clear CMOS memory.
7 - PSWRD	Enable or clear (and disable) User and System Administrator Passwords stored in EEPROM: <ul style="list-style-type: none">• UP to enable passwords — DEFAULT• DOWN to clear passwords.
8 - KEYB power on	Enable or disable power on using the keyboard: <ul style="list-style-type: none">• UP to disable keyboard power on• DOWN to enable keyboard power on — DEFAULT.
9 - BOX DEFINITION	Select box type: <ul style="list-style-type: none">• UP to select a Mini Tower model — DEFAULT.• DOWN to select a Desktop model.
10 - BIOS Recovery Mode	<ul style="list-style-type: none">• UP to enable normal mode — DEFAULT.• DOWN to enable recovery mode.

1. On the switch, UP=OFF and DOWN=ON.

The HP Summary Screen and *Setup* Program

This section introduces the HP Summary Screen and the HP *Setup* program. You can use the Summary Screen and the *Setup* program to configure your PC Workstation and solve configuration problems with your PC Workstation.

Viewing the HP Summary Screen

Check your PC Workstation's configuration when you first use the PC Workstation and each time after you install, remove, or upgrade accessories. To check the configuration:

- 1 Turn on the display and then the PC Workstation. If the PC Workstation is already turned on, save your data and exit all programs, then restart the PC Workstation. Consult your operating system documentation for any special instructions concerning turning off and then restarting your PC Workstation.
- 2 While the start-up logo appears on your display, press **[Esc]**. This takes you to the HP Summary Screen. (To go immediately into the *Setup* program, and bypass the Summary Screen, press **[F2]** instead of **[Esc]**). The Summary Screen is displayed for only a short time. To retain the screen (until you decide to leave it), press **[F5]**.

Starting the HP *Setup* Program

- 1 Turn on the display and then the computer. If the PC Workstation is already turned on, save your data and exit all programs, then restart the PC Workstation. Consult your operating system documentation for any special instructions concerning turning off and then restarting your PC Workstation.
- 2 Press **[F2]** while **[F2] Setup** is displayed at the bottom of the screen. If you fail to press **[F2]** in time and the start-up process continues, you will need to restart your PC Workstation to go through the POST again so you can press **[F2]**.
- 3 The opening screen of the PC Workstation's *Setup* program is displayed, similar to the one on the next page. Note that the Main menu selection is highlighted.

4 Technical Information
The HP Summary Screen and Setup Program

PhoenixBIOS Setup Utility					
Main	Advanced	Security	Boot	Power	Exit
<div>Plug & Play O/S: [NO] Reset Configuration Data: [NO] System Time: [13:06:48] System Date: [11/16/1997] Key Click: [Disabled] Keyboard auto-repeat rate: [30/sec] Keyboard auto-repeat delay: [1/2 sec] Numlock: [Auto]</div>					Item-Specific Help
F1 Help	↑ ↓	Select Item	F7/F8 Change Values		F9 Setup Defaults
ESC Exit	← →	Select Menu	Enter Select > Sub-Menu		F10 Previous Values

NOTE In addition to the Exit menu, you can also use the **[Esc]** key to save your settings and exit the *Setup* program. Use **[F12]** to exit without saving any changes.

Pressing the **[Left]** or **[Right]** arrow keys will take you to the next menu option.

Use the **[Up]** and **[Down]** arrow keys to scroll through the items on the screen.

Saving Your Changes and Leaving *Setup*

When you have made all your changes, you must save them and exit *Setup*.

- 1 Press **[Esc]** (twice if necessary) to enter the Exit menu.
 - 2 Select **Exit Saving Changes** to save your changes and exit *Setup*.
- The PC Workstation will automatically restart. If you set a User Password, the PC Workstation will display the power-on prompt. Enter the User Password to use the PC Workstation.

Configuring Your Network Connection

Use the information in this section if your PC Workstation comes with an HP-supplied integrated network solution.

You must use the PC Workstation's *Setup* program (described on page 101) to change the integrated Ethernet interface settings. The following table summarizes which network options you can set using the *Setup* program.

Network Setup Items ¹	Where to find in <i>Setup</i>
Enable the integrated network interface. ²	In the Advanced menu, go to the Integrated Network Interface submenu.
Enable your PC Workstation to be started (booted and logged on) from the network.	In the Security menu, go to the Boot Devices Security submenu (described below).
Enable remote power-on of your PC Workstation.	In the Power menu, enable the Integrated Network item.
From "Suspend Wakeup" mode, enable your PC Workstation to return to full power when a command is received by the integrated network interface.	In the Power menu, enable the Integrated Network item.
Determine boot device priority.	In the Boot menu, select the Boot Device Priority list item (described on the next page).

1. For full information on setting up your network, refer to the online *Network Administrator's Guide* preloaded onto your PC Workstation.
2. Disabling the LAN card will only disable certain features of the LAN card, such as remote power-on or remote wakeup, not the card itself.
















Controlling the Network Security Features

The Security Features allow you to enable starting from the network if you want the PC Workstation to start from a LAN server.

4 Technical Information









Configuring Your Network Connection

To enable starting from the network:

- 1 With the *Setup* program running (see page 101), use the  or  key to select the Security menu.
- 2 Press  to highlight the line Boot Devices Security and press  to select the submenu.
- 3 Highlight the line Start from Network and press  or  to change the option to Enabled.
- 4 You can disable the other boot options to prevent the PC Workstation from booting if the network or server ever fails:
 - a Press  to go to the Start From Floppy line. Press  or  to change the option to Disabled.
 - b Press  to go to the Start From IDE CD-ROM line. Press  or  to change the option to Disabled.
 - c Press  to go to the Start From IDE HDD line. Press  or  to change the option to Disabled.
- 5 Save your changes and exit.

Selecting the Boot Device Priority

You can determine the order in which your PC Workstation looks for boot devices, including boot devices on the network. To do this:

- 1 With the *Setup* program running, use the  or  key to select the Boot menu.
- 2 Press  to highlight the line Boot Device Priority and press  to select the submenu.
- 3 Use the  and  keys to select a boot device, and then press the  or  key to move the device up or down the list.

You can also change the boot device order without entering *Setup*. Look for the prompting message when your PC Workstation first starts up after re-booting.

Configuring a SCSI Accessory

There are two ways to configure a SCSI accessory:

- *SCSISelect* — for use with Internal Wide 16-bit SCSI devices & HP FastRAID (Adaptec).
- *SCSI Configuration Utility* — for use with External and Internal 16/8-bit SCSI devices (Symbios).

NOTE

You cannot boot from a device connected to the Symbios controller when HP FastRAID is installed.

To disable a boot device:

- 1 Go to the **Advanced** menu in the *Setup* program.
- 2 Select the SCSI channel you wish to set.
- 3 Enable or disable the **Option ROM Scan** as required.

Using SCSI Select

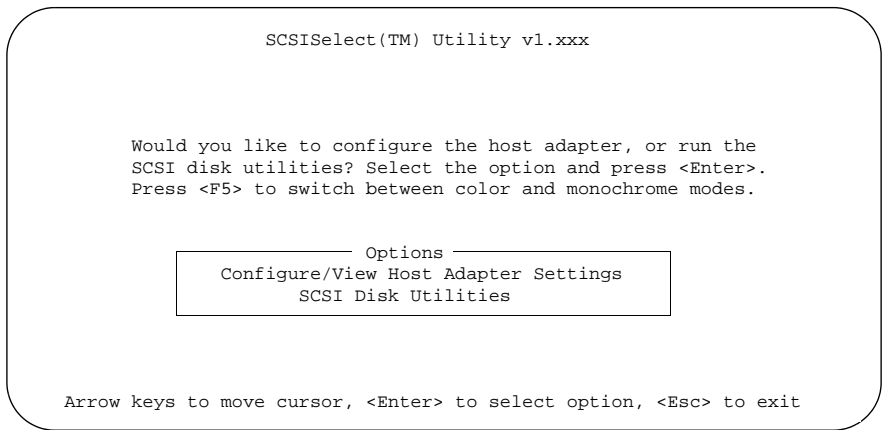
ATTENTION





The *SCSISelect*TM utility is intended for advanced users only. Note that the *SCSISelect* options displayed on your screen may be different from those described here. Some options are not displayed if the HP FastRAID option is installed.

The *SCSISelect* utility is accessed by pressing **F6** during the computer's start-up process when the message **Press F6 for SCSISelect(TM) Utility!** is displayed.

4 Technical Information
Configuring a SCSI Accessory

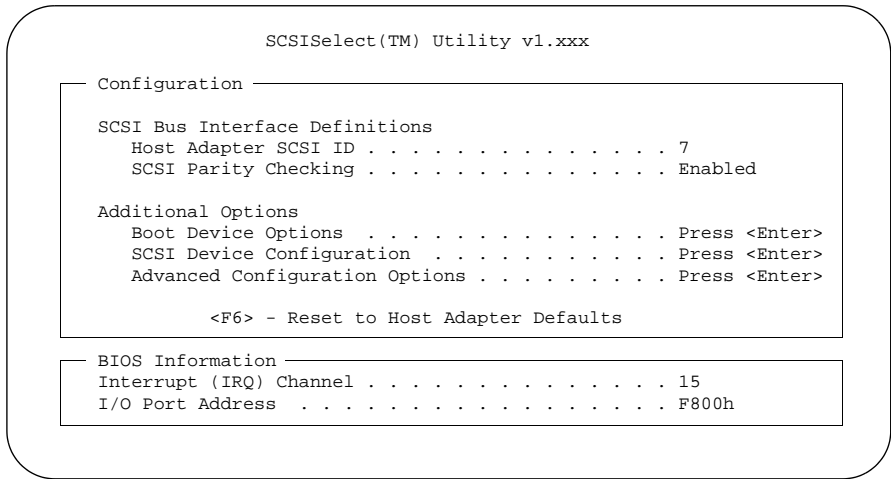
The Options menu is displayed.



Use the  and  keys and the  key to make selections in the *SCSISelect* utility. Press  at any time to return to the previous menu.

Configure/View
Interface Settings Menu

It is recommended that you do not change these settings.



SCSI Channel Interface Definitions:

- **Host Adapter SCSI ID**
Changes the adapter SCSI ID from its default value of 7.
- **SCSI Parity Checking**
Enable or disable host adapter SCSI parity checking. Most currently available SCSI devices do support SCSI parity. You should disable SCSI Parity Checking if any of the attached SCSI devices do not support SCSI parity.

Additional Options:




- **Boot Device Options**
Press to display the Boot Device Configuration menu, described on the next page.
- **SCSI Device Configuration**
Press to display the SCSI Device Configuration menu.
- **Array 1000 BIOS** (only if HP FastRAID is installed)
This option is enabled by default, and instructs the system to use the special BIOS for the FastRAID option. If you disable this option and re-boot, the system will use its normal BIOS and FastRAID will be disabled.
- **Advanced Configuration Options**
Press to view the Advanced Configuration Options menu.

4 Technical Information
Configuring a SCSI Accessory

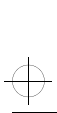
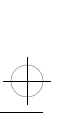
Boot Device
Configuration Menu

This menu lets you configure the SCSI boot device. To find out the SCSI ID of a specific SCSI device, you can run the SCSI Disk Utilities (refer to page 112).

```
----- Boot Device Configuration -----
Select SCSI peripheral from which to boot
To view peripheral by ID# select "SCSI Disk Utilities" from previous menu
Boot SCSI ID ..... 0
----- Option Listed Below Has NO EFFECT if MULTI LUN Support is Disabled -----
Boot LUN Number ..... 0
```

Use the  and  keys to move between options. Press  to display a menu with a selection of values.

- **Boot SCSI ID**
This parameter is the SCSI ID of the boot device. The default value is 0.
- **Boot Lun Number**
More advanced SCSI devices can have several logical units. This option indicates the logical unit (or Lun) on which to boot for the drive chosen in the **Boot SCSI ID**. The default value is 0.






4 Technical Information

Configuring a SCSI Accessory

SCSI Device
Configuration Menu

This menu lets you configure parameters for each SCSI device on the SCSI bus. To configure a specific SCSI device, you need to know which SCSI ID it uses. To know the SCSI ID of a specific SCSI device, you can run the SCSI Disk Utilities (refer to page 112).

SCSI Device Configuration								
SCSI Device ID	#0	#1	#2	#3	#4	#5	#6	#7
Initiate Sync Negotiation...	yes	yes	yes	yes	yes	yes	yes	yes
Maximum Sync Transfer Rate..	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
Enable Disconnection.....	yes	yes	yes	yes	yes	yes	yes	yes
Initiate Wide Negotiation...	yes	yes	yes	yes	yes	yes	yes	yes
Options Listed Below Have NO EFFECT if the BIOS is Disabled								
Send Start Unit Command....	no	no	no	no	no	no	no	no
BIOS Multiple LUN Support..	no	no	no	no	no	no	no	no
Include in BIOS Scan.....	yes	yes	yes	yes	yes	yes	yes	yes

Use the  and  keys to move between options. Press  to display a menu with a selection of values.

- **Initiate Sync Negotiation**
Some older SCSI-1 devices do not support synchronous negotiation. Set Initiate Sync Negotiation to **No** for these devices.
- **Maximum Sync Transfer Rate**
If the SCSI device is an UltraWide SCSI device, you can use the maximum value of 40.0 MB per second. For Ultra narrow SCSI or Wide SCSI devices you can select a maximum transfer rate of 20.0 MB per second.

Certain older SCSI-1 devices do not support UltraWide SCSI (up to 40 MB per second) or Ultra narrow SCSI or Wide SCSI data transfer rates (up to 20 MB per second). Select a Maximum Sync Transfer Rate of 10.0 MB per second for these devices.
- **Enable Disconnection**
To optimize SCSI bus performance, Enable Disconnection should be set to **Yes**.



4 Technical Information
Configuring a SCSI Accessory




- **Initiate Wide Negotiation**
This option determines whether the SCSI channel attempts 16-bit data transfer instead of 8-bit data transfer.
- **Send Start Unit Command**
When set to **Yes** this option reduces the load on your computer's power supply by allowing the interface to power-up SCSI devices one-at-a-time when you start your computer. When set to **No** each SCSI device powers up at the same time.

This option is not supported by some SCSI devices. Some SCSI devices require a jumper to be changed before they can respond to this command.

- **BIOS Multiple LUN Support**
More advanced SCSI devices can have several logical units (LUN). This option determines whether booting a SCSI device that has multiple LUNs is supported. Set this option to **Yes** if your boot device has multiple LUNs. It is set to no by default.
- **Include in BIOS Scan**
This setting, when set to **Yes**, allows the SCSI device to be controlled by the host adapter with this SCSI ID. When set to **No**, the adapter does not control the SCSI device.

Advanced Configuration Options Menu It is recommended that these settings are not changed.

Advanced Configuration Options		
Plug and Play Scam Support	Enabled	
Extended BIOS Translation for DOS Drives > 1 GByte	Enabled	
Reset SCSI Bus at IC Initialization.....	Enabled	
Options Listed Below Have NO EFFECT if the BIOS is Disabled		
Host Adapter BIOS (Configuration Utility Reserves BIOS Space)..	Enabled	
Support Removable Disks Under BIOS as Fixed Disks.....	Boot Only	
Display F6 Message During BIOS Initialization.....	Enabled	
BIOS Support for Bootable CD-ROM.....	Enabled	
BIOS Support for Int13 Extensions.....	Enabled	

Use the  and  keys to move between options. Press  to display a menu with a selection of values.

- **Plug and Play Scam Support**
When enabled, this option automatically configures Plug and Play compatible SCSI devices. For SCSI devices that do not support Plug and Play, set this option to **Disabled**. By default, it is enabled.
- **Extended BIOS Translation for DOS Drives >1 GByte**
This option is no longer used (and must always be "Enabled").
- **Reset SCSI Bus at IC Initialization**
When the SCSI controller receives an IC Reset command from the central processor, it can reset either itself and the SCSI bus, or just itself. By default, it will reset both itself and the SCSI bus.
- **Host Adapter BIOS**
This option enables or disables the SCSI Adapter BIOS. Several options in *SCSISelect* utility are only valid if the SCSI adapter BIOS is enabled. The SCSI adapter BIOS must be enabled if the computer boots from a SCSI hard disk drive. This option is enabled by default.
- **Support Removable Disks Under BIOS as Fixed Disks**
When **Boot Only** is selected, only the removable media drive designated as the boot device is treated as a hard disk drive. If **All Disks** is selected, all removable-media drives supported by the BIOS are treated as hard disk drives. No removable-media drives are treated as hard disk drives when **Disabled** is selected. In this case, removable-media drives must be controlled through operating system drivers.
- **Display <F6> Message During BIOS Initialization**
When enabled, this option displays the message **Press <F6> for SCSISelect(TM) Utility** during BIOS initialization. When disabled, this message is not displayed, although you can still press the **(F6)** key for the *SCSISelect* utility. This option is enabled by default.
- **BIOS Support for Bootable CD-ROM**
When enabled, this option provides BIOS support for booting from a CD-ROM drive. It is enabled by default.
- **BIOS Support for Int13 Extensions**
When enabled, this option provides BIOS support for hard disk drives with more than 1024 cylinders. It is enabled by default.

4 Technical Information

Configuring a SCSI Accessory

SCSI Disk Utilities

When the SCSI Disk Utilities are selected from the initial Options menu, the *SCSISelect* utility scans the SCSI bus and lists all the SCSI devices on the SCSI bus. The list shows the SCSI ID and name of each SCSI device. You can use this list to discover the SCSI ID of any device on the SCSI bus.

Use the and keys to highlight a device and press to display the **Format Disk/Verify Media** menu.

- **Format Disk**

This utility can be used to perform a low-level format of a hard disk. Most SCSI disks are pre-formatted and do not need low-level formatting. You should note that this function can take several hours.

- **Verify Disk Media**

This utility scans for media defects on the selected SCSI device. Press the key to abort this utility.

Using the SCSI Configuration Utility

The Symbios Logic SCSI Configuration Utility lets you view and change the default configuration for your host adapter and all SCSI devices connected to it, or for individual SCSI devices.

Default Settings You Can Change

The following two tables show the configuration settings you can change. The first table shows the global settings which impact your host adapter and all SCSI devices connected to it. Be very careful if you change any of these settings. The second table shows the device settings which apply to individual devices.

Settings for the Host Adapter and All Devices	Default Settings
SCAM Support	On
Parity	Enabled
Host Adapter SCSI ID	7
Scan Order	Low to High (0-Max)
Removable Media Support	None

Settings for Individual SCSI Devices	Default Settings
Synchronous Transfer Rate (MB/sec)	40
Data Width	16
Disconnect	On
Read Write I/O Timeout (secs)	10
Scan for Devices at Boot Time	Yes
Scan for SCSI LUNs	Yes
Queue Tags	Enabled

4 Technical Information
Configuring a SCSI Accessory

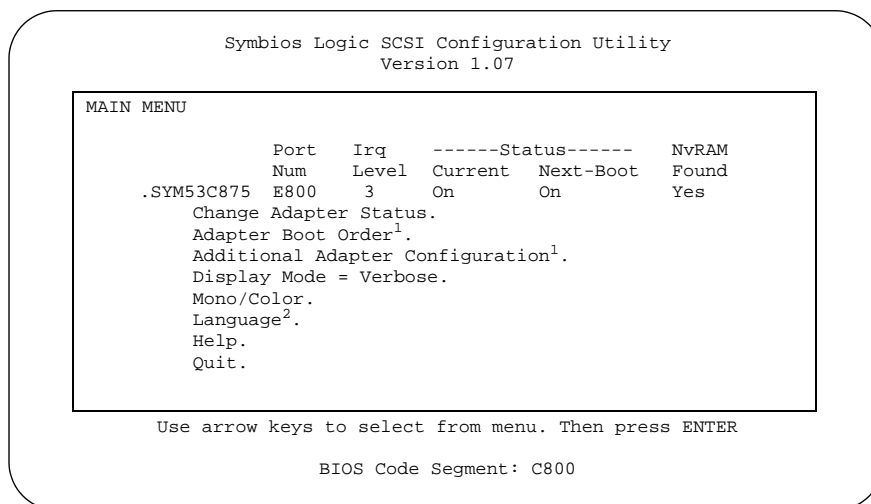
Starting the SCSI Configuration Utility

You access the SCSI Configuration Utility by pressing **F6** when the message **Press F6 to start Configuration Utility...** is displayed during the PC Workstation's start-up routine. A further message is then displayed: **Please wait, invoking Configuration Utility...** before the Main menu of the Symbios Logic SCSI Configuration utility appears.

Main Menu

NOTE

The items shown on your screen may be different from those shown below.



- ¹. Only used if more than one Symbios card is installed.
- ². Not available (English only).

Use the **↑** and **↓** keys and the **Enter** key to make a selection from this menu.

You can only select an adapter if the current status is "On". Changes are possible only if NVRAM (non-volatile memory on your adapter) is present.

4 Technical Information

Configuring a SCSI Accessory

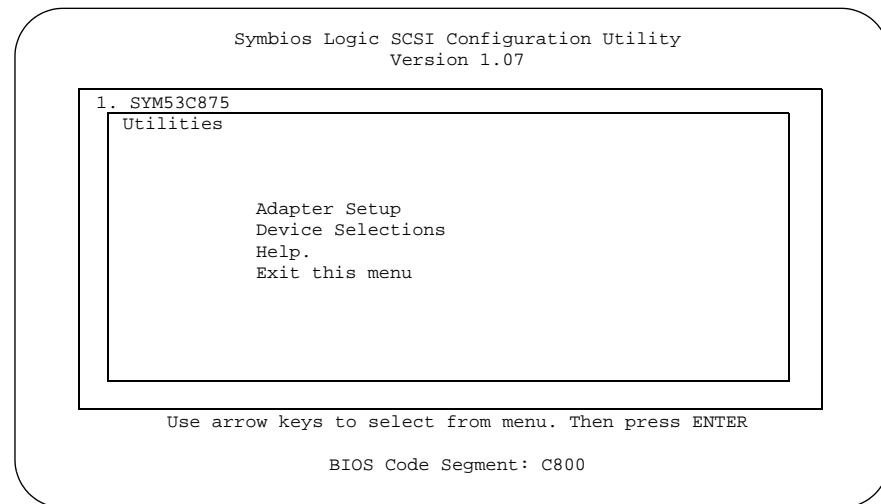
Adapter Boot Order	<p>This option is only available when you have more than one host adapter installed. It lets you set the order in which host adapters boot. When you select this option the Boot Order menu is displayed.</p> <p>To change an adapter's boot order (from the Boot Order menu), select it and press <input type="button" value="↵ Enter"/>. You are then prompted to enter the new boot sequence number. When you are satisfied with the boot order, press <input type="button" value="Esc"/> to exit this menu.</p>
Change Adapter Status	<p>This option lets you activate or deactivate a host adapter and all SCSI devices attached to it. The change takes place after a re-boot, which is automatic when you exit from the Configuration utility after using this option to make a change. When you select this option the Change Status on Next Boot menu is displayed.</p> <p>To toggle an adapter's status 'on' or 'off' (from the Change Status on Next Boot menu), select it and press <input type="button" value="↵ Enter"/>. When you are satisfied with your selections, press <input type="button" value="Esc"/> to exit this menu.</p>
Display Mode	<p>This option determines how much information about your host adapter(s) and SCSI devices is displayed on the screen during the PC Workstation's start-up routine. For more complete information, select the verbose setting; for a faster boot, select the terse setting.</p>
Mono/Color	<p>This option lets you choose between a black and white or a color display for the SCSI configuration utility. If you are using a black and white monitor, you may need to select the mono setting to get a more readable screen.</p>
Help	<p>This option displays a help screen giving information about the Main menu.</p>
Quit	<p>This option exits the SCSI Configuration utility.</p>

4 Technical Information

Configuring a SCSI Accessory

Adapter Utilities Menu

When you select (click on and press ) a host adapter from the Main menu, the Utilities menu is displayed:



Adapter Setup

This option lets you view and change the selected adapter settings.

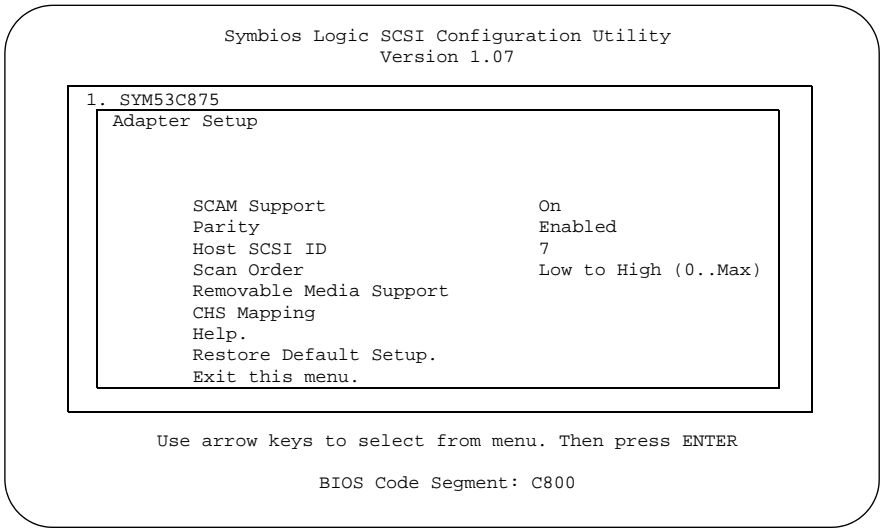
Device Selections

This option lets you view and change settings for the devices attached to the selected adapter.

After you have made changes to the configuration of a host adapter or to any connected SCSI device, you will return to this menu.

Adapter Setup Menu

When you select Adapter Setup from the Adapter Utilities menu, the Adapter Setup menu is displayed:



The settings in this menu are global settings that effect the selected host adapter and all SCSI devices attached to it.

SCAM Support The Symbios Logic BIOS version 4.x and above supports the SCSI Plug and Play protocol called SCAM (SCSI Configured AutoMatically). You can turn this off if you wish.

Parity Symbios Logic PCI to SCSI host adapters always generate parity, but some SCSI devices do not. For this reason you can disable parity checking.

NOTE When disabling parity checking, you may have to disable disconnects for certain devices as parity checking for the re-selection phase is not disabled. If a device does not generate parity, and it disconnects, the I/O never completes because the re-selection never completes.

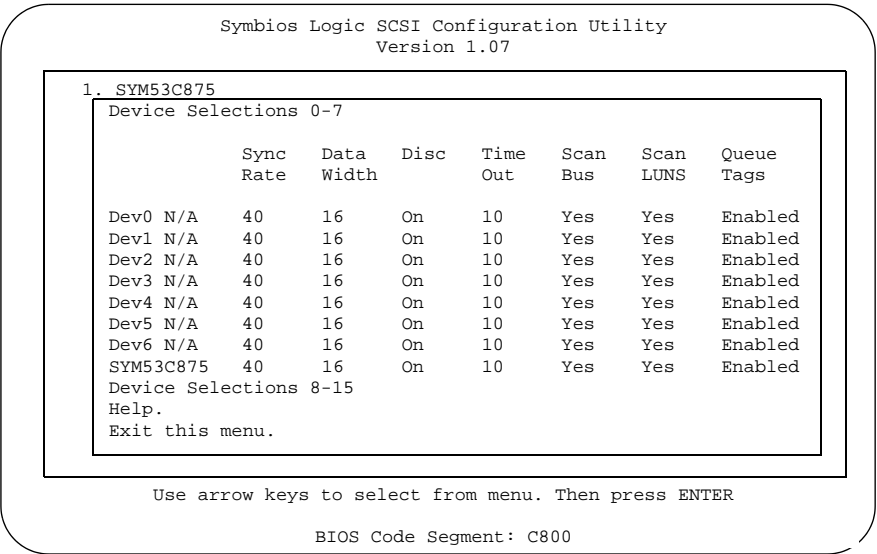
4 Technical Information

Configuring a SCSI Accessory


Host SCSI ID	In general it is not advisable to change your host adapter ID from the default value of 7, as this gives it the highest priority on the SCSI bus. However, if you have two adapters sharing the same SCSI devices, you should give one of the adapters a currently-unassigned ID to avoid duplication of SCSI IDs.
Scan Order	This option lets you tell the host adapter BIOS and your device drivers to scan the SCSI bus from low to high (0 to max) SCSI ID, or from high to low (max to 0) SCSI ID. If you have more than one device on a SCSI bus, changing the device order changes the drive letters which are assigned to them by the system. This will change the boot order.
Removable Media Support	Only used when removable disk drives are installed. For more information, refer to the <i>User's Guide</i> that came with you removable disk drive.
CHS Mapping	When performing a 'low format', CHS mapping should be set to Alternate CHS Mapping for full compatibility with other SCSI adapters. This is the default setting.

Device Selections Menu

When you select Device Selections from the Adapter Utilities menu, the Device Selections menu is displayed:



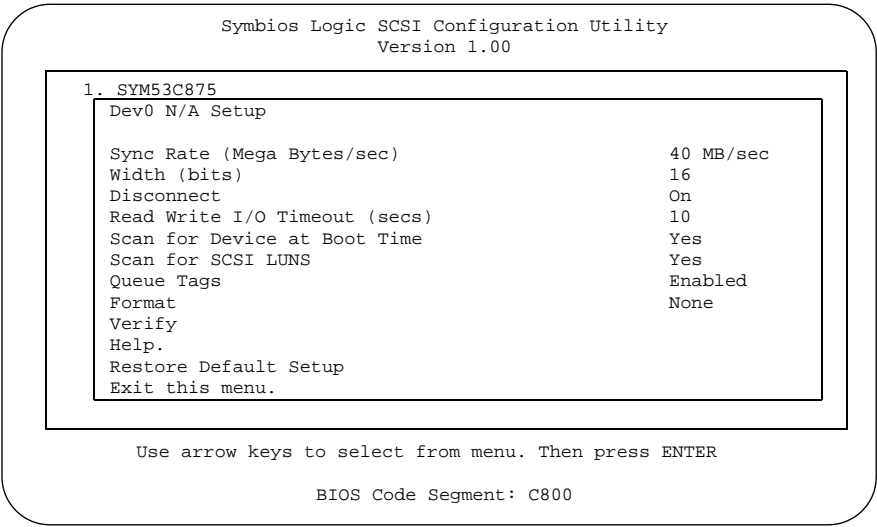
This menu provides information about individual SCSI devices attached to the selected host adapter, and the adapter itself.

To make changes to these settings, select a device from the list and press  to display the individual Device Setup menu.


4 Technical Information
Configuring a SCSI Accessory

Device Setup Menu

When you select a device from the Device Selections menu, the Device Setup menu is displayed:



This menu provides information about an individual SCSI device.

To make changes to these settings, select an item from the list and press .

Sync Rate (Mega Bytes/sec)

This option lets you set the transfer rate for the device. The available choices are Off, 10 MB/sec, 20 MB/sec, or 40 MB/sec. For example, for a Fast SCSI device, you would select 10 MB/sec.

Width (bits)

This option lets you set the width, in bits, for the device. The choices are 8 or 16. For example, if the device is an external SCSI device, you would set the width to 8 bits.

4 Technical Information

Configuring a SCSI Accessory

Disconnect	<p>This option lets you enable or disable disconnects for the device.</p> <p>To optimize SCSI bus performance, this option should be set to Enabled when two or more SCSI devices are connected to the host adapter. Set the option to Disable to achieve slightly better performance when only one SCSI device is connected to the SCSI bus.</p>
Read Write I/O Timeout (sec)	<p>This option lets you enter a read write timeout value in seconds for the device.</p>
Scan for Device at Boot Time	<p>This option lets you specify whether the device is scanned for at boot time. The choices are Yes or No.</p>
Scan for SCSI LUNS	<p>More advanced SCSI devices can have several logical units (LUNs). This option lets you specify whether SCSI LUNs are scanned for at boot time. The choices are Yes or No.</p>
Queue Tags	<p>This option lets you specify whether queue tags are enabled or disabled. In a multi-tasking environment this option must be enabled. It should only be disabled for troubleshooting.</p>
Format Disk	<p>This utility can be used to perform a low-level format of a hard disk. Most SCSI disks are pre-formatted and do not need low-level formatting.</p>
Verify Disk Media	<p>This utility scans for media defects on the selected SCSI device. Press the Esc key to abort this utility.</p>

Exiting from the Configuration Utility

To exit from the Configuration utility, press **Esc** the necessary number of times to return to the Main menu, and then press **F1** to quit.

4 Technical Information Using the ArrayConfig Program

Using the Array*Config* Program

You can use the Array*Config*TM program to:

- Create a new array, and
- Manage existing arrays on your system's hard disk drives.

Creating a New Array

Before you create a new array, you will need to do the following:

- ☐ Back up any existing data that you wish to save on your hard disk drives. Once the drives have been configured and the operating system re-installed, you can restore your backed up data.
- ☐ Create a bootable floppy from the HP Kayak XU/XW PC Workstation Drivers CD-ROM provided with your system.

You can create a new array using either of the following options.



Express Setup - use this option if you want to create an array (up to two drives) quickly and easily. Array*Config* asks you a few simple questions and uses your answers to create the kind of array that best meets your needs. This process is similar to the "Wizards" used in many applications. You do not need to know the technical details of how arrays are configured. Refer to "Using Express Setup" on page 123.

Custom Setup - this option allows advanced users to create arrays (with more than two drives) with customized configurations. You will need to know more technical details about how arrays are configured to benefit from this option. Refer to "Using Custom Setup" on page 125.

NOTE

Your computer will attempt to boot from a non-SCSI disk (for example, an IDE drive) if one is installed. To boot from the FastRAID array, either disable or remove any non-SCSI disks on your computer before running the Array*Config* utility or ensure that the Array 1000 adapter is set to the highest priority in the Setup program (**Boot>Boot Order**).

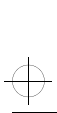
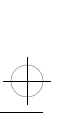
Using Express Setup To create an array using Express Setup, you will need to do the following:

- 1 Select the *ArrayConfig* menu option by pressing the hot key — the letter that appears in a different color. (The hot key letters are underlined in the following instructions). You can also press the ↑ and ↓ keys until the option is highlighted and then press .
- 2 Insert the *ArrayConfig* utility disk in drive A and reboot your computer. The *ArrayConfig* utility will start automatically.
- 3 Read the text that appears on the initial *ArrayConfig* screens. Press any key to view the next screen, or press  to return to the previous screen.
- 4 When you see the Setup Type Selection Menu, select **Express Setup**.
- 5 When the next screen appears, select the type of array you want to create:
 - Select **Optimized for Performance** if you want the fastest possible data input and output from the new array. This type of array does not have special data protection features, however.
 - Select **Optimized for Data Protection** if your main concern is to protect the files on the array from disk failure. This type of array safeguards files in the array even if one of the array disks fails. To use this option, two disk drives are required.
- 6 At the prompt, enter the number of drives to use in the array. You can create either a one- or two-drive array with the Express Setup.

NOTE

When you select a single hard drive for RAID 0, the drive will be striped and optimized using the ARO-1130's cache memory, but no actual array will be created. A single drive optimized in this way, although significantly faster, will not provide the same level of performance as a two-drive RAID 0 array.

- 7 When the next menu appears, select the type of application that you will run on your computer. (Select **Other Applications** if you are not sure what type of application you will use.) *ArrayConfig* will use your answer to create the best array configuration for your applications.



4 Technical Information
Using the ArrayConfig Program

- 8 When the next menu appears, select a boot order for the new array.
- Select **Disk Array will be Boot Drive** if you want your computer to boot from the new array. If you selected **Optimized for Data Protection** in Step 4, booting from an array safeguards the information on your boot drive.
 - Select **Disk Array will not be a Boot Drive** if you do not want your computer to boot from the new array. (If you only have one array, it will automatically be the boot drive.)
- 9 When you have finished all these menu selections, wait while *ArrayConfig* creates the array. This may take up to 30 minutes, especially if the disk drives are large.

A message appears when the array has been created. An error message appears if the *ArrayConfig* encounters some problems (for example, an array already exists). If this happens, run *ArrayConfig* again and use the Custom Setup option.


- 10 Press  until you're back at the Main Menu, and exit *ArrayConfig*.

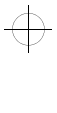
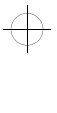
Installing Windows
NT 4.0

- 11 Begin the installation of Windows NT 4.0 by booting from the floppy diskettes you made before creating your array.

NOTE

Do not boot from the Windows NT CD-ROM as the hard drive will not be detected.

- 12 When prompted, insert your drivers diskette into drive A and press . When the driver has finished loading, you can continue with the Windows NT installation. For more information, refer to your operating system's documentation on your Drivers CD-ROM.



Using Custom Setup To create an array using Custom Setup, you will need to do the following:

NOTE

You can also perform most of these advanced options with the HP RAID Device Manager once you've completed the installation and the HP RAID Device Manager has been installed. Refer to the HP RAID Device Manager's online Help for more information on using this utility.





- 1 Insert the *ArrayConfig* diskette in drive A and reboot your computer. Wait until *ArrayConfig* starts automatically.
- 2 Read the text that appears on the initial *ArrayConfig* screens. Press any key to view the next screen, or press **Esc** to return to the previous screen.
- 3 When you see the Setup Type Selection Menu, select **Custom Setup**. Then wait while *ArrayConfig* scans your system for information about your host adapter and SCSI devices.
- 4 When the Main Menu appears, select **Disk Array Operations**.
- 5 Select **Create New Array** from the Disk Array Operations menu.
- 6 Type a name for the array and press **Enter**. The name can be up to 15 characters long and can include spaces and any other printable characters.
- 7 Select an array type from the following options:
 - RAID 0: Data is striped across the disks in a RAID 0 array, allowing for faster data input and output than a single disk. RAID 0 arrays do not store redundant data; if any disk in the array fails, all data is lost.
 - RAID 1: Data is mirrored on one pair of disks. If one disk fails, data is still safe. The actual usable data capacity of the array equals half the available disk space.
- 8 Type the number of drives you want in the array, not including spare drives, and press **Enter**. The number of drives available for assignment is listed on the screen. (You will not be prompted for the number of drives if you are creating a RAID 1 array, because RAID 1 arrays have two drives by definition.)

4 Technical Information

Using the ArrayConfig Program

NOTE

When you select a single hard drive for RAID 0, the drive will be striped and optimized using the ARO-1130's cache memory, but no actual array will be created. A single drive optimized in this way, although significantly faster, will not provide the same level of performance as a two-drive RAID 0 array.

- 9 When the next screen appears, press  to highlight a channel. Select drives for the array by pressing the ↑ and ↓ keys until the drive name is highlighted, and then press **Ins** or . The names of selected drives appear in the box on the right side of the screen. To select drives on a different channel (if necessary) press  to select another channel and then select the drives from the SCSI IDs on Channel menu. To deselect the drive you most recently added, press .

CAUTION

A warning appears if you select a disk that has partitions. Do not select disks with partitions if they contain data you want to keep, because any existing data will be erased when the disk becomes part of the array.

When you have selected the number of drives you specified in Step 8, the next screen appears automatically. If you are creating a RAID 1 array and if there are any unassigned drives, the screen prompts you to define spare drives for the array.

- 10 If you do not want a spare, type **n** and continue with step 12. If you want to select dedicated spares, follow these steps:
- a At the prompt, type **y**.
 - b At the next prompt, type 1 or 2.
 - c Select one or two spares, using the same method you used to select disks for the array.
- 11 When the Initialize Mode menu appears, select **Initialize Array to Zero**. This operation begins immediately. A graph on the screen shows the progress of this operation.

CAUTION

If the drives contain data, all the data is lost when you initialize the array.

Select **Low-Level Format** only if the drives were previously formatted on another system or if you are using drives other than new HP accessory drives (where there's a possibility of surface defects). Low-level formatting takes a long time for large disk drives. (Refer to the section "Initializing an Array" on page 130 for more information.)

- 12 When the menu of block sizes appears, select a block size. (This menu does not appear for RAID 1 arrays.)

The default block size (64 KBytes) gives the best overall performance. The allowable block sizes are 8, 16, 32, 64, and 128 KBytes.

- 13 When you see the message **Initialization of [array name]** is complete, press any key to return to the Disk Array Operations menu.
- 14 To create additional arrays (if disks are available), return to Step 5. When all arrays are created, exit from *ArrayConfig*, remove the *ArrayConfig* diskette, and reboot the computer. After you reboot you can write data to the arrays.
- 15 Press **[Esc]** until you're back at the Main Menu, and exit *ArrayConfig*.
- 16 Begin the installation of Windows NT 4.0 by booting from the floppy diskettes you made before creating your array.

NOTE

Do not boot from the Windows NT CD-ROM as the hard drive will not be detected.

- 17 When prompted, insert your drivers diskette into drive A and press **[Enter]**. When the driver has finished loading, you can continue with the Windows NT installation. For more information, refer to your operating system's documentation on your Drivers CD-ROM.

4 Technical Information

Using the ArrayConfig Program

Managing an Existing Array

You can manage an existing array in the following ways:

- Making a bootable array
- Displaying array information
- Deleting an array
- Initializing an array
- Adding or deleting a spare disks

Making the Array Bootable

Follow these steps if you want your computer to boot from the newly created array or if you want to change the boot order of existing arrays:

- 1 Select **Display Boot Order** from the Main Menu. The Boot Order for Singles and Arrays window appears.
- 2 If the newly created array is listed as Unit 0 at the top of the list, no changes are necessary; if it has some other unit number, highlight the array name and press to select it.
- 3 Use the arrow keys to move the selected array to the top of the list. Then press to deselect it.
- 4 When you are finished, press to return to the Main Menu.


NOTE

You cannot use this procedure to change the boot order of a non-striped SCSI disk drive (see the "Resolving Problems" on page 134 for notes on booting from the Narrow SCSI BIOS). If you want to do this, create a one-drive RAID 0 "array" from the disk.

Displaying Array Information

Follow these steps to display information about existing arrays defined in your computer:

- 1 Select **Disk Array Operations** from the Custom Setup Main Menu.
- 2 Select **Display Arrays** from the Disk Array Operations menu.

- 3 When the list of arrays appears, highlight the array for which you want information and press .
- 4 View the information that appears on the screen. This includes array type and status, array size, and information about each disk in the array.
- 5 Press any key to return to the Disk Array Operations menu.

Deleting an Array

CAUTION

All data is lost when you delete an array! Before you delete an array, back up any data you want to keep.

Follow these steps to delete an array:

- 1 Select Disk Array Operations from the Main Menu.
- 2 Select **Delete Array** from the Disk Array Operations menu.
- 3 When the list of arrays appears, select the array you want to delete.

CAUTION

A warning appears if you select an array that has partitions. Do not delete an array with partitions if it contains data you want to keep, because any existing data will be erased. Be especially careful not to select your boot array!

- 4 View information about the array and make sure you really want to delete it. Press any key to continue.
- 5 Type **y** to delete the array (or **n** to cancel the operation).
- 6 When the message **[Array name] deleted** appears, press any key to continue.

The drives that were formerly part of the array can now be used as stand-alone drives or as members of another array. Deleting an array may change the boot order and the drive assignment of other arrays and disks.

4 Technical Information

Using the ArrayConfig Program

NOTE

You can identify individual drives by blinking the drive lights while you are running the HP RAID Device Manager software. Refer to the HP RAID Device Manager Software online documentation for more information.

Initializing an Array

When you create a new array in Custom Setup, you are automatically prompted to initialize (format) it. You can also select the Format/Initialize Array option as a separate Custom Setup command. This could be necessary to re-initialize an array that has become corrupted. Here is some additional information on the two initialization methods:

- **Initialize Array to Zero:** (Recommended method) Fills the array with zeroes. This option is faster than a low-level format, but it does not verify the integrity of the disks.
- **Low-level Format:** Performs a low-level SCSI format. This writes a consistent pattern to the disks, checks the disks for defects, and fills the array with zeroes. Low-level formatting can take some time (up to 1 hour) if the disks are large. You cannot abort a low-level format once it has started.

CAUTION

Formatting or initializing an array erases all data on the array and cannot be aborted once it has started. If the array contains data you want to keep, be sure to back it up first!

Follow these steps to initialize an array:

- 1 Select **Disk Array Operations** from the Main Menu.
- 2 Select **Format/Initialize Array** from the Disk Array Operations menu.
- 3 When the list of arrays appears, select the array you want to initialize.
- 4 Type **y** to confirm that you want to format the array.

CAUTION

A warning appears if you select an array that has partitions. Do not initialize an array with partitions if it contains data you want to keep, because any existing data will be erased. Be especially careful not to initialize your boot array!

- 5 When the Select Format Mode menu appears, select **Initialize Array to Zero** (recommended) or **Low-Level Format**.
- 6 When the list of block sizes appears, select a block size. The allowable block sizes are 8, 16, 32, 64 (the default), or 128 KBytes. (This menu does not appear if the array is a RAID 1 array with only two drives.) The default block size gives the best overall performance. Formatting begins immediately.
- 7 When you see the message **Initialization of [array name]** is complete, press any key to return to the Disk Array Operations menu.

NOTE

You will need to install the operating system after the array is initialized. Refer to "Installing Windows NT 4.0" on page 124.

Adding and Deleting Spares

Dedicated spare disks (spares) are an important data protection and real-time recovery feature of RAID 1 arrays (RAID 0 arrays do not support spares). Up to two dedicated spares can be defined for each array. If a disk in an array fails while the computer is running, a spare is activated immediately to take its place. The array software automatically reconstructs the necessary data on the new disk, and array operation continues uninterrupted.

Adding a Dedicated Spare


When you create an array you have the option of adding one or two dedicated spares. You can also add dedicated spares to an existing array at a later time. You cannot add dedicated spares to an array if:

- The array already has two dedicated spares
- The remaining single disks are not at least as large as the smallest disk in the selected array

4 Technical Information

Using the ArrayConfig Program

Follow these steps to add one or two dedicated spares to an already-existing array:

- 1 Select **Disk Array Operations** from the Main Menu.
- 2 Select **Add/Delete Spare Drive** from the Disk Array Operations menu.
- 3 Select the array to which you want to add the dedicated spare.
- 4 Select **Add Spare Drive** from the Add/Delete Spare menu.
- 5 Select a SCSI channel on the left, if necessary, and then press → to move to the list of disks on the right. Disks are grayed out if they are already used in an array, or if they are smaller than the members of the array. Highlight an available disk and press . Then select another disk for the second spare, if necessary. The new dedicated spare is added immediately.


CAUTION

A warning appears if you select a disk that has partitions. Do not select disks with partitions if they contain data you want to keep, because any existing data will be erased. Be especially careful not to select your boot disk as a spare!

- 6 Press any key to continue.

Deleting a Dedicated Spare

Follow these steps to delete a dedicated spare:

- 1 Select **Disk Array Operations** from the Main Menu.
- 2 Select **Add/Delete Spare Drive** from the Disk Array Operations menu.
- 3 When the list of spare drives appears, select the one you want to delete and press .
- 4 Select **Delete Spare Drive** from the Add/Delete Spare Drive menu. The dedicated spare is deleted immediately.
- 5 Press any key to continue. The disk that was formerly a dedicated spare can now be used as a spare for another array or as a member of a new array.

Optimizing Performance

Check HP's World Wide Web site for more information on how to optimize the performance of HP FastRAID on your system. Refer to "HP World Wide Web Site" on page 144.


To change HP FastRAID settings:

- Click the **Start** button, select **Programs**, then **HP RAID Device Manager**, then **RAID Device Manager**. To modify the caching parameters, you must set a password. In the HP RAID Device Manager window, select the **View** menu, then **Change Password**.

NOTE

You can install the HP RAID Device Manager from the driver's CD-ROM or the HP website.

The first time you use the HP RAID Device Manager, no password is set. When requested to enter the Old Password, press  to go to the New Password box.

- 1 In the Storage Configuration window, select the  RAID icon. Then select **Operations...**, then **Optimize Performance**.
- 2 In the Optimize Performance window, select the pop-up menu to set the application you require.

If you want to change the values already set, select **Edit** and perform the changes required.

4 Technical Information



Using the ArrayConfig Program

Resolving Problems

If you experience problems using the HP FastRAID option, check that:

- 1 The ARO-1130 adapter BIOS sign-on message appear during bootup? If not, check that the ARO-1130 adapter is properly seated in the RAID*port* slot.
- 2 All SCSI bus cables and power cables are connected.

If you are having trouble booting from the FastRAID array:

- 1 Check the settings in the HP *Setup* program that the Array1000 Family Raid Adapter is selected in position one. To do this:
 - a From the HP Setup program, select the *Boot* menu group, then the *Hard Disk Drive* item. If the Array1000 Family Raid Adapter is already in position one, then no changes are necessary. Otherwise, select the Array1000 Family Raid Adapter by using the up and down arrows, then press the  key to move it up the list. Save your changes before you exit the *Setup* program.
- 2 Check that the array has been selected as the boot device using the Array*Config* utility:
 - a Insert the Array*Config* utility disk in drive A.
 - b Reboot your computer and when the Array*Config* Main menu appears, select **Display Boot Order**. If the array is at the top of the list, preceded by the words Unit 0, no changes are necessary. Otherwise, highlight the array name and press , then use the arrow keys to move it to the top of the list.
 - c Exit the Array*Config* utility and reboot your computer.
- 3 Check the HP Setup settings to make sure that each drive has a unique SCSI ID.

4 Technical Information

Using the ArrayConfig Program

- 4 The External 16/8-bit Symbios BIOS and the FastRAID BIOS cannot be loaded at the same time in BIOS setup. The Symbios BIOS should be disabled (from the **Advanced/External and Internal Wide 16/8-bit SCSI** window, disable **Option ROM Scan**). This may be fixed in a later version of the BIOS. Check the World Wide Web at the following site: <http://www.hp.com/go/kayaksupport/> to see if this has been corrected.

Consequence: you cannot boot from devices connected to the Symbios controller at the same time as Wide SCSI devices. It is, however, possible to manually switch from bootable SCSI devices, connected to the Symbios controller, to Wide SCSI devices.

- 5 Ensure that you boot from the Windows NT diskettes provided and not from the CD-ROM. If you boot from the CD-ROM, the hard drive will not be found (problem relating to Windows NT).
- 6 Ensure that the FastRAID/Array1000 drivers are installed. To install these drivers:
 - a Shut down your PC Workstation, remove the ARO-1130 adapter, and restart your system.
 - b Click the Start menu, point to Settings, and then click Control Panel.
 - c Double-click the SCSI Adapters icon, then the Drivers tab.
 - d Click Add, Have Disk..., and insert the Adaptec Array1000 driver diskette.
 - e When requested to enter the driver path, type **A:\winnt** and follow the installation instructions (the Windows NT 4.0 CD-ROM may be needed).
 - f Shut down your computer and re-install the FastRAID card.

4 Technical Information Using the ArrayConfig Program

Frequently Asked Questions

Q: Can I boot from an array?

A: Yes, you can boot without any problem from an array.

Q: If you have two UltraWide SCSI drives connected to the RAID controller, does one of them have to be the bootable drive?

A: No, the entire RAID array is bootable rather than the individual drives that make up the array. If there are two drives configured in a RAID 0 array, the array will automatically be bootable.

Q: Can a third UltraWide SCSI hard drive be added to be used as the boot device, as defined in the support boundaries?

A: Yes, you can add a third drive, but the third drive cannot be included in the same RAID array. For example, you could create a RAID 1 array with two drives plus a third drive configured as a spare. Or, you could configure two arrays: one with two drives and one with one drive.

Q: Can we connect a third SCSI drive to the Narrow SCSI controller.


A: You can connect a third drive to the Symbios controller, but both the Symbios BIOS and UltraWide BIOS cannot be loaded at the same time. That means that you cannot boot from both SCSI devices at the same time. If you only need to boot from the Symbios SCSI occasionally, then you can disable (from BIOS setup) the Internal Wide 16-bit SCSI **Option ROM Scan** and enable the Symbios SCSI **Option ROM Scan** to boot on the Symbios SCSI. When you're finished, disable the Symbios SCSI **Option ROM Scan** and enable the Internal Wide 16-bit SCSI **Option ROM Scan**.

NOTE

You cannot change the priority of RAID and non-RAID devices through the ArrayConfig utility's Custom Setup routine. RAID devices will always have the highest priority even if the SCSI address of the non-RAID device is set to 0.

4 Technical Information

Using the ArrayConfig Program

The only way to boot on the non-RAID device is to go to the *SCSISelect* Utility, then select Configure/View Interface Settings. Use the arrow keys to select the SCSI Device Configuration, then in the Include in BIOS Scan option, move to the SCSI Device ID to be disabled and press the  key.

Q: After I installed the FastRAID card, I could not boot Windows NT from my non-striped wide SCSI drive. I get a blue screen with the message "BOOT DEVICE NOT FOUND".

A: Even if the drive is not configured in a RAID array, you can boot on it before installing the FastRAID card provided that the required SCSI drivers are installed.



4 Technical Information

Using the ArrayConfig Program



5

**Hewlett Packard Support and
Information Services**

5 Hewlett Packard Support and Information Services

Introduction

Introduction

Hewlett Packard computers are engineered for quality and reliability to give you many years of trouble-free service. To ensure that your desktop system maintains its reliability and to keep you up-to-date with the latest developments, HP and a worldwide network of trained and authorized resellers provide a comprehensive range of service and support options which are listed below:

- HP-Authorized Reseller
- HP SupportPack
- HP Support Assistant CD-ROM
- HP Information Services

Service	Means of Access
HP Forum on CompuServe	Modem
HP Forum on America Online (US only)	Modem
HP World Wide Web Site	World Wide Web Access
HP Drivers/BIOS diskettes	Delivered by mail

- HP Support Services
 - Technical phone support
 - Lifeline phone support
 - Network phone-in support

NOTE

When calling any of the international telephone numbers listed in this chapter, replace the '+' with your international telephone access code.

Your HP-Authorized Reseller

HP-Authorized Resellers have been trained on HP PC Workstation equipment and are familiar with its configuration and environment. Authorized Resellers can also answer questions regarding non-HP hardware, software and systems as well as answer queries about usage not intended for, or not common for, the HP PC Workstation.

Authorized HP Resellers can also offer consulting services tailored to your specific needs regarding product development or custom installations. Similar support services are offered by third parties or the HP Customer Support organization in your country.

HP SupportPack

HP's three-year SupportPack is available from your local reseller. It must be purchased within 30 days of purchasing your HP PC Workstation.

The concept of SupportPack is simple. It allows you to extend your one-year on-site hardware warranty to a three-year on-site hardware warranty, offering next day on-site response.

SupportPack is valid for the piece of equipment for which it was bought, but is not transferable from one piece of equipment to another.

5 Hewlett Packard Support and Information Services
HP Support Assistant CD-ROM

HP Support Assistant CD-ROM

HP Support Assistant is a yearly subscription service on two CD-ROMs: one for software; the other for support documentation.

The software CD-ROM is updated monthly and contains the latest HP drivers and utilities. The documentation CD-ROM is updated quarterly and contains:

- Product manuals and service manuals
- Installation and configuration information
- Troubleshooting information
- Technical reference manuals

Subscriptions to HP Support Assistant can be obtained with an order form which is available from the HP FIRST Faxback system. Request document number 9025 (US and Asia Pacific) or 19025 (Europe). Subscriptions can also be obtained by contacting the following numbers:

Region	Phone Number	Fax Number
Asia-Pacific	+65 740-4477	+65 740-4499
Europe	+31 (55) 384279	+31 (55) 434455
Latin America	+1 (317) 364-8882	+1 (317) 364-8888
US/Canada	1 (800) 457-1762	+1 (317) 364-8888

Hewlett-Packard Information Services

Hewlett-Packard Electronic Information Services are available 24 hours a day, 7 days a week, ensuring that the most up-to-date information is always available.

HP Forum on CompuServe

The HP Systems Forum on CompuServe® is an on-line service, accessible via modem. This service provides information about your HP PC Workstation, and allows you to communicate with other HP users through an on-line user forum. HP users share their knowledge and experience with you, and you will be able to ask, or answer, technical questions about your HP PC Workstation, and HP products.

You can also download the latest versions of drivers, BIOS and software utilities for HP PC Workstations.

As a preferred Hewlett Packard customer, you are invited to join CompuServe at no initial charge.

For the United States and the United Kingdom, call the number shown below and ask for representative 51. For all other locations, first call the worldwide number to obtain the number of your local sales office, then call your local sales office and ask for representative 51.

Country	Local Call / Freephone Number	Direct Number
United States	1 (800) 848-8199	+1 (614) 529-1349
United Kingdom	(0800) 289378	+44 (1272) 760680
Worldwide	—	+1 (614) 529-1349

CompuServe will send you a free introductory membership immediately, including information on how to access CompuServe.

At the CompuServe ! prompt, type **GO HP**.

5 Hewlett Packard Support and Information Services

Hewlett-Packard Information Services

HP Forum on America Online

The HP Forum on America Online is an electronic information and communication service which can be accessed via modem.

To access the HP Forum:

- select **Keyword Search** from the menu,
- type **HP**,
- press .

This will load the HP Home Page directly onto your screen.

In the HP Forum you can ask and answer questions about HP products and you can also download drivers, software application notes, or utilities for HP products.

Membership information can be obtained by calling 1 (800) 827-6364, giving the preferred customer number 1118.

HP World Wide Web Site

The HP World Wide Web site gives you access to information about HP, its products, including product data sheets, service and support information, electronic newsletters and technical tips. You can also download the latest versions of drivers, BIOS and software utilities.

The Access Guide Directory guides you through the information and services available.

World-Wide Web URL

For product information: <http://www.hp.com/go/kayak>

For service and support information: <http://www.hp.com/go/kayaksupport>

Ordering Drivers and BIOS on Diskette

You can order diskettes from HP, with the latest versions of drivers, BIOS and software utilities. The diskettes will be delivered by mail.

Information for ordering diskettes is set out in the tables below:

North and Latin America	Europe
Phone +1 (970) 339 7009 Monday - Saturday 24 hours per day	Phone +44 (1429) 865511 Monday - Friday 8.30 a.m. - 6.00 p.m. Central European Time
Fax +1 (970) 330 7655	Fax +44 (1429) 866000
Mail US Driver Fulfillment for Hewlett-Packard PO Box 1754, Greeley, Colorado 80632 USA	Mail European Fulfillment for Hewlett-Packard c/o StarPak International, Ltd., Hartlepool, Cleveland, TS25 2YP United Kingdom

Australia	Asia - Pacific
Phone + 61 (2) 565 6099 Monday - Friday 8.30 a.m. - 5.30 p.m. Australian Eastern Time	Phone + 65 740 4477 Monday - Friday 8.30 a.m. - 5.30 p.m. Singapore Time
Fax + 61 (2) 519 5631	Fax + 65 740 4499
Mail Fulfill: Plus Pty Ltd., Private Bag 75, Alexandria NSW Australia 2015	Mail Fulfill: Plus Pte Ltd., No 51, Ubi Ave. 3, Singapore 1440

To identify a specific BIOS, driver or utility for your PC Workstation, please follow the steps listed below prior to placing your order.

- Contact your authorized HP reseller for assistance in selecting the appropriate driver.
- If your reseller is unable to help you, call HP FIRST for the most up-to-date list of drivers.

5 Hewlett Packard Support and Information Services
HP Support Services

HP Support Services

Hewlett-Packard provides a three-year hardware warranty which includes on-site service during the first year after purchase, and a return service during the second and third years after purchase. This warranty coverage will apply from the nearest HP or HP-authorized service outlet.

HP telephone support for your PC Workstation is available during the first year of your hardware warranty. This service will also provide technical assistance with the basic configuration and setup of your PC Workstation and for the bundled or pre-loaded operating system.

Lifeline Telephone support is available during the second and third years of hardware warranty, via the Lifeline program, which is a fee-based service.

HP does NOT provide support for PC Workstations configured as network servers. We recommend HP NetServers for your network server requirements.

NOTE

Reloading the software bundled or pre-loaded on your PC Workstation is not covered by the HP three-year warranty.
For your bundled application, HP recommends that you keep the master CD-ROM.

Your HP-authorized reseller offers various service contracts which can be tailored to your particular support needs.

Hewlett-Packard Telephone Support

HP North American
Customer Support
Center

Assistance from the HP North American Customer Support Center is available Monday to Friday, 7:00 am to 6:00 pm Mountain time.

The number is: +1 (970) 635-1000

HP European Customer
Support Center

Assistance from the HP European Customer Support Center is available Monday to Friday, 8:30 am to 6:00 pm Central European time.¹

Country	Language	Local Number
United Kingdom	English	0171 512 5202
Ireland	English	01 662 5525
Netherlands	Dutch	020 606 8751
Belgium	Dutch	02 626 8806
	French	02 626 8807
Switzerland	French	084 880 1111
	German	084 880 1111
Germany	German	0180 525 8143
France	French	01 43 62 34 34
Austria	German	0660 6386
Norway	Norwegian	22 11 6299
Denmark	Danish	3929 4099
Sweden	Swedish	08 619 2170
Italy	Italian	02 26410350
Spain	Spanish	902 321 123
Portugal	Portuguese	01 441 7199

1. For non-listed European countries, support is available in English by calling +44 171 512 5202.

5 Hewlett Packard Support and Information Services

Lifeline Telephone Support

Please have the following information ready when you call so that your enquiry can be dealt with quickly:

- Your HP PC Workstation model number and serial number.
- The operating system version and the configuration.
- A description of the software installed and the accessories used.

Lifeline Telephone Support

Lifeline is a fee-based telephone support program for PC Workstations available after the one-year telephone support provided as part of the hardware warranty has expired.

Your call can either be charged to your phone bill at a per-minute rate or to your credit card (Visa, Mastercard or American Express) at a flat fee.

The charge begins AFTER you have been put in contact with a support technician. If your problem is found to be covered by the HP Hardware Warranty, no charge will be applied.

In the US please call the appropriate number listed below.

Number	Method of Payment	Charge Type
1 (900) 555-1500	Charged to phone bill	per-minute rate
1 (800) 999-1148	Charged to credit card	Flat fee

In Europe, please call the telephone support center (+44 171 512 5202).

Free access to HP information services is not affected by this service. You are encouraged to access HP Information Services throughout the life of your PC Workstation, whether in or out of warranty.

HP Network Phone-in Support Service (NPS)

The HP Network Phone-in Support Service (NPS) provides fast access to HP experts in networked Multivendor environments.

It can help you to:

- Resolve complex network problems.
- Leverage HP's alliances with leading Network Operating Systems and Network manufacturers.
- Support your HP and non-HP products with a single telephone call.
- Increase network uptime.

You can purchase the HP NPS service as an annual contract, billable in advance annually, bi-annually, quarterly, or at an hourly rate. This contract service provides unlimited toll-free access to HP Response Center Engineers (RCEs).

To obtain an HP NPS contract, contact your HP-authorized reseller or, if you are in the US, call (800) 437-9140.

5 Hewlett Packard Support and Information Services

Summary

Summary

The table below summarizes the services and support available from HP or authorized resellers.

Service	Covers	Period covered	Response time	Fee	When available	Purchase from
Basic Warranty	Parts and labor for HP products: first year on-site parts & labor; second and third year parts only.	Three years from date of purchase.	Next working day for on-site.	No charge.	At time of purchase.	HP.
HP SupportPack on-site service	Parts and labor for HP products.	First three years.	Next working day.	One fee which covers the three years.	Within 30 days of purchase.	HP Authorized reseller.
HP Support Assistant	CD-ROM containing: Product Manuals, Technical Information and Product features.	Released quarterly.	N/A	Annual subscription.	Anytime.	HP.
Electronic services	Technical information, drivers, utilities, tools and diagnostics.	Anytime.	24-hour access.	No charge.	Anytime.	HP BBS, WWW, CompuServe, America Online.
Technical Phone support	Basic assistance for PC Workstation setup, configuration, start-up and hardware diagnosis.	First year.	Business hours.	No charge.	At time of purchase.	HP.
Lifeline phone support	Basic assistance for PC Workstation setup, configuration, start-up and hardware diagnosis.	After first year.	Business hours.	Per-call fee, no time limit.	Anytime after first year.	HP.
HP Network Phone-in support	Advanced remote technical support for multivendor networked environments.	Annual contract.	Business hours: 24-hour/ 7-day service also available.	Annual fee, or minimum fee per incident.	Anytime.	HP Authorized reseller.
Service Contracts	Technical Support.	Customer defined.	As required.	Annual fee, or fee per incident.	Anytime.	Reseller.

5 Hewlett Packard Support and Information Services
Hewlett-Packard Marketing Headquarters

Hewlett-Packard Marketing Headquarters

Should you wish to contact Hewlett-Packard, check your local telephone directory for the HP Sales and Service Office near you. If you cannot find a convenient HP office, you can write to one of the major HP Sales and Service Offices or one of the Worldwide Marketing Headquarters listed here.

ASIA

Far East Sales Region Hdqtrs
Hewlett-Packard Asia Ltd.
22/F Peregrine Tower
Lipp Centre
89 Queensway, Central
Hong Kong

LATIN AMERICA

Hewlett-Packard
Prolongación Reforma No. 700
Col. Lomas de Santa Fe
Del. Alvaro Obregón
México
01210 Mexico, D.F.

EUROPE

European Operations Hdqtrs
Hewlett-Packard S.A.
150, route du Nant-d'Avril
P.O. Box 1217
Meyrin 2/Geneva
Switzerland

USA

Intercon Operations Hdqtrs
Hewlett-Packard Company
3495 Deer Creek Road
P.O. Box 10495
Palo Alto, CA 94303-0896
USA

MIDDLE EAST / AFRICA

Middle East / Central Africa Sales Hdqtrs
Hewlett-Packard S.A.
Rue de Veyrot 39
CH-1217 Meyrin 1/Geneva
Switzerland

CANADA

Hewlett-Packard Ltd.
6877 Goreway Drive
Mississauga
Ontario L4V 1M8
Canada



5 Hewlett Packard Support and Information Services
Hewlett-Packard Marketing Headquarters



Glossary

8-bit SCSI Also called narrow SCSI. Ultra narrow SCSI provides data transfer rates of up to 20 MB per second.

10/100BaseT Refers to the 100 Mbit/s network technology over category 5 UTP (unshielded twisted pair) cable that is compatible with the proposed IEEE 802.3 standard. This technology, which takes the CSMA/CD protocol to 100 MBits/s operation, is also referred to as 802.3u or Fast Ethernet.

16-bit SCSI Also called wide SCSI. Ultra wide SCSI provides data transfer rates of up to 40 MB per second.

adapter An accessory board that connects to the system board via an accessory board slot.

ADPCM Adaptive Differential Pulse Code Modulation. A data compression technique. See PCM.

A-law A method of data compression that enables sampling of sound at a resolution of 16 bits, but that generates the same quantity of data as an 8-bit sampling rate.

AVI files Audio-Video Interleaved file format used with Microsoft's Video for Windows.

Basic MIDI format Allows MIDI channels 13 to 16 of the General MIDI operation mode to be used when notes are played through MIDI.

BBS Bulletin Board System. A computer that uses a modem and software to serve as an information source for other computers equipped with a modem. Hewlett-Packard has a BBS that can be reached at +1 (408) 553-3500.

BIOS Basic Input-Output System. Software that provides an interface between the computer hardware and the operating system.

bus An electrical connection over which information is transported.

cache A block of high-speed memory used for the temporary storage of data and processor instructions.

CD-ROM Compact Disc Read Only Memory. A mass storage device that uses compact disc technology. ROM CDs can store data, but most cannot be written to.

Compression A technique for compacting data for more efficient storage or transmission. The sound quality of compressed audio data is greatly reduced. See entries for A-law and μ -law.

CD-RW Compact Disc Read Write. A mass storage device that uses compact disc technology to read data on CDs and write data to CDs.

CMOS Complementary Metal-Oxide Semiconductor memory requires very little power to operate. The contents of your computer's CMOS memory are preserved when you turn off the

Glossary

computer. It is used to store information that must be maintained, such as your computer's configuration.

controller A device that enables another device (such as a hard disk) to communicate with the computer.

DAT Digital Audio Tape.

DIMM Dual In-line Memory Module. These memory modules provide a 64-bit data path for improved system performance.

device driver Software that enables the computer to interface with a specific peripheral, such as a printer or display.

Digital audio Digitally recorded sound such as speech and sound effects.

DMA channel Direct Memory Access channel. Speeds up I/O to and from the system's memory by avoiding CPU processing. However, the system limits the number of boards that can use DMA.

DVD player Digital Versatile Disk player. A standardized device to play digital audio and video sequences.

ECC Error Correcting Code can detect and correct data errors in memory modules.

expansion slot A slot inside the computer, connected to the system board, that can be used for accessory boards.

extended memory Memory which can be addressed by the processor in the area of memory above the first 1 MB.

Extended MIDI format Allows MIDI channels 1 to 10 of the General MIDI operation mode to be used when notes are played through MIDI.

FM synthesis A technique for synthesizing sound that uses a combination of modulated sine waves to produce different waves forms.

General MIDI format A standard set of 128 sounds. Allows 16 channels to be used when notes are played through MIDI.

IDE Integrated Device Electronics. An interface standard for communications between the computer and a hard disk or CD-ROM.

IRQ Interrupt Request. A signal, that when received by the processor, halts the current process and allows a different task to be undertaken.

IRQ line The Interrupt Request line is the signal line used to notify the CPU that it wants to send or receive data for processing.

Glossary

jumper An electrically-conductive part that is used to connect two or more points on a circuit board. Commonly used to select configuration options.

LAN Local Area Network. A general-purpose communications network that interconnects a variety of devices within a limited geographical area. A LAN might connect computers on adjacent desks, within a building, or within several buildings of a campus.

mass storage Any device used to store large amounts of data. Usually refers to hard disks and tape backup units.

memory modules Miniature boards containing memory chips. Used for increasing the amount of memory available in the computer.

MID files Standard file format used to store MIDI sequence information.

MIDI Musical Instrument Digital Interface. An international hardware/software standard that specifies the cable and hardware interface that allows several devices, instruments, and computers to interchange music codes and events.

MIDI mapper A Windows utility that lets you edit MIDI key maps, patch maps, and channel mappings.

Mixing Combining sounds from several sources.

MPEG Motion Picture Expert Group. A standard for video sequence compression. You can play back MPEG files from the WEB or a video CD-ROM.

MPU-401 MIDI interface hardware standard developed by the Roland Co.

multimedia Combining static media (such as text and pictures) with dynamic data (such as sound, video, and animation) on the same system.

network server mode A security feature that prevents unauthorized use of an input device (like a keyboard or mouse) while your computer is running as an unattended network server.

OLE Object Linking and Embedding. A Windows feature that allows different object types (such as speech clips or notes of music) to appear in a document. The objects can be linked, in which case they remain separate files, or embedded, where they become a part of the document.

Patch A MIDI term referring to a particular sound or voice.

PCM Pulse Code Modulation. A method of storing uncompressed digital audio. The audio is represented by the amplitude of the audio signal sampled at regular intervals.

pixel Picture element. The smallest addressable spot on the screen.

Glossary

Polyphonic More than one voice played simultaneously.

Plug and Play Plug and Play is an architecture designed to simplify installation and configuration of new devices in a PC.

POST Power-On Self-Test. A series of tests your computer performs when you switch the computer on.

Q-Sound Audio-processing technique to simulate reverb/surround sound.

RAM Random Access Memory. This memory is used to hold programs and data temporarily.

resolution A measure of the visible detail on a screen or printout. Screen resolution is measured in 'pixels across' by 'pixels down' by 'number of colors'. Printer resolution is measured in dpi (dots-per-inch).

ROM Read-Only Memory. Computer memory used to store parts of the computer's operating system permanently. ROM chips can contain instructions and data.

Sampling The process of converting an analog signal into digital data.

Sampling rate The rate of analyzing a sound. The more frequently a sound is sampled, the more closely it will match the original sound.

SCAM SCSI Configured Automatically. A protocol which automatically assigns device IDs to SCSI devices which support SCAM.

SCSI Small Computer System Interface. A high-speed data bus used for connecting hard disks, tape drives, and other accessories to your computer (see 8-bit SCSI and 16-bit SCSI).

SCSI chain Devices connected on a single SCSI bus.

SDRAM Synchronous Dynamic Random Access Memory. This memory is used to improve performance of your PC Workstation

Sequencer A device used to record note information from MIDI devices.

Setup program Used to inform the computer about its configuration, for example the amount of memory installed. The setup program is stored in ROM on the system board.

shadow RAM A method of relocating the system and/or video BIOS from slower ROM chips to faster RAM to improve system performance.

SIMM Single In-line Memory Module. These memory modules can provide a 32-bit data path.

Sound files Files containing sound data. Sound files are usually stored in one of two formats, with the extension .WAV or .MID.

Glossary

Synthesizer Hardware for generating audio from software. Typical methods used are FM synthesis and wave table synthesis. to the display.

terminator A resistor at the end of a data connection cable that prevents the signal from reflecting back along the cable.

Total harmonic distortion A specification for quantifying the fidelity of audio processing equipment.

Tracks The virtual tracks used by MIDI sequencers.

video controller A chip or expansion card which converts signals in the computer into displayable signals.

video RAM Memory that enables or speeds up drawing to the screen or increases resolution or color options.

Voices The number of synthesized sounds that a device can generate simultaneously.

WAV files A Microsoft file format for storing digital audio data.

Wavesample A sample used in a wavetable or sampling synthesizer to reproduce a musical instrument.

WRAM Windows RAM. Dual-ported memory, which allows for simultaneous input of data from the graphics controller and output of data

μ-law A method of data compression that enables the sampling of sound at a resolution of 16 bits, but that generates the same quantity of data as an 8-bit sampling rate.

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Regulatory Information and Warranty



Regulatory Information

DECLARATION OF CONFORMITY according to ISO/IEC Guide 22 and EN 4501 4

Manufacturer's Name: HEWLETPACKARD

Manufacturer's Address: 5 Avenue Raymond Chanas
38320 Eybens
FRANCE

Declares that the product:

Product Name: HP Kayak XU & XW PC Workstation
Model Number:

Conforms to the following Product Specifications:

SAFETY International: IEC 950: 1991 + A1 + A2 + A3 + 4
Europe: EN 60950: 1992 + A1 + A2 + A3

EMC CISPR 22: 1993
EN 55022: 1994 Class B
EN 50082-1: 1992
IEC 801-2: 1992 / prEN 55024-2: 1992 - 4 kV CD, 8 kV AD
IEC 801-3: 1984 / prEN 55024-3: 1991 - 3 V/m
IEC 801-4: 1988 / prEN 55024-4: 1992 - 0.5 kV Signal Lines,
1 kV Power Lines
IEC 555-2: 1982 + A1: 1985 / EN 60555-2: 1987
IEC 1000-3-3: 1994 / EN 61000-3-3: 1995

Supplementary information: The product herewith complies with the requirements of the EMC Directive 89/336/EEC and the Low Voltage Directive 73/23/EEC both amended by the Directive 93/68/EEC and carries the CE marking accordingly



Grenoble
March 1998

Jean-Marc JULIA
Product Quality Manager

FCC (for USA only)**Federal Communications Commission Radio Frequency Interference Statement****Warning:**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates and uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to correct the interference by one or more of the following measures:

- reorient or relocate the receiving antenna
- increase the separation between the equipment and the receiver
- connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- consult the dealer or an experienced radio/TV technician for help.

Hewlett-Packard's FCC Compliance Tests were conducted with HP-supported peripheral devices and HP shielded cables, such as those you receive with your system. Changes or modifications not expressly approved by Hewlett-Packard could void the user's authority to operate the equipment.

Notice for Canada

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la Class B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Safety Warning for the USA and Canada

If the power cord is not supplied with the computer, select the proper power cord according to your local national electric code.

USA: use a UL listed type SVT detachable power cord.

Canada: use a CSA certified detachable power cord.

For your safety, never remove the PC's cover without first removing the power cord and any connection to a telecommunication network. Always replace the cover before switching on again.

Si le cordon secteur n'est pas livré avec votre ordinateur, utiliser un cordon secteur en accord avec votre code électrique national.

USA: utiliser un cordon secteur "UL listed", de type SVT.

Canada: utiliser un cordon secteur certifié CSA.

Pour votre sécurité, ne jamais retirer le capot de l'ordinateur sans avoir préalablement débranché le cordon secteur et toute connection à un réseau de télécommunication. N'oubliez pas de replacer le capot avant de rebrancher le cordon secteur.

Changing the Battery

There is a danger of explosion if the battery is incorrectly installed. For your safety, never attempt to recharge, disassemble or burn the old battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. The battery in this PC is a lithium battery which does not contain heavy metals, nevertheless, in order to protect the environment, do not dispose of batteries in household waste. Please return used batteries to the shop from which you bought them, to the dealer from whom you purchased the PC, or to Hewlett Packard, so that they can either be recycled or disposed of in an environmentally sound way. Returned used batteries will be accepted free of charge.

Changement de la pile

Il y a danger d'explosion lorsque la pile n'est pas installée correctement. Pour votre sécurité, ne jamais essayer de recharger, de démonter ou de brûler l'ancienne pile. Remplacer uniquement avec une pile du même type ou d'un type équivalent recommandé par HP. La pile de cet ordinateur est une pile au lithium qui ne contient pas de métaux lourds, néanmoins, afin de protéger l'environnement, il ne faut pas la jeter dans les ordures ménagères mais la rendre au magasin ou vous l'avez achetée, ou revendeur où vous avez acheté l'ordinateur, ou à Hewlett Packard, pour qu'elle soit recyclée, ou stockée de manière qui ne nuit pas à l'environnement. Les piles usées seront acceptées gratuitement.

Notice for the United Kingdom

The HP Kayak XU and XW PC Workstations are approved under approval number NS/G/1234/J/100003 for indirect connection to Public Telecommunication Systems within the United Kingdom.

Notice for the Netherlands

Bij dit apparaat zijn batterijen geleverd. Wanneer deze leeg zijn, moet U ze niet weggooien maar inleveren als KCA.

Notice for Germany

Wenn die Batterie nicht korrekt eingebaut wird, besteht Explosionsgefahr. Zu ihrer eigenen Sicherheit sollten Sie nicht versuchen, die Batterie wiederaufzuladen, zu zerlegen oder die alte Batterie zu verbrennen. Tauschen Sie die Batterie nur gegen den gleichen oder ähnlichen Typ aus, der vom Hersteller empfohlen wird. Bei der in diesem PC integrierten Batterie handelt es sich um eine Lithium-Batterie, die keine Schwermetalle enthält. Batterien und Akkumulatoren gehören nicht in den Hausmüll. Sie werden vom Hersteller, Händler oder deren Beauftragten kostenlos zurückgenommen, um sie einer Verwertung bzw. Entsorgung zuzuführen.

Noise Declaration for Germany

Lärmangabe nach Maschinenlärmmverordnung - 3 GSGV (Deutschland)
LpA < 70 db am Arbeitsplatz normaler Betrieb nach EN27779: 11.92.

Notice for Japan

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。
取り扱い説明書に従って正しい取り扱いをして下さい。

This equipment is in the Class B category information technology equipment based on the rules of the Voluntary Control Council For Interference by Information Technology Equipment (VCCI). Although aimed for residential area operation, radio interference may be caused when used near a radio or TV receiver. Read the instructions for correct operation.

Notice for Korea

사용자 안내문 (B급 기기)
이 기기는 비업무용으로 전자파장애검정을 받은 기기로서, 주거지역에서는 물론 모든 지역에서 사용될 수 있습니다.

Recycling Your PC

HP has a strong commitment toward the environment. Your HP Personal Computer has been designed to respect the environment as much as possible.

HP can also take your old PC back for recycling when it reaches the end of its useful life.

HP has a product take-back program in several countries. The collected equipment is sent to one of HP's recycling facilities in Europe or the USA. As many parts as possible are reused. The remainder is recycled. Special care is taken for batteries and other potentially toxic substances, which are reduced into non-harmful components through a special chemical process.

If you require more details about HP's product take-back program, contact your dealer or your nearest HP Sales Office.

HP Hardware Warranty

Important: This is your hardware product warranty statement. Please, read it carefully.

Warranty terms may be different in your country. If so, your Authorized HP Dealer or Hewlett-Packard Sales and Service Office can give you details.

HP products may contain remanufactured parts equivalent to new in performance or may have been subject to incidental use.

HP products external to the system processor unit —such as external storage subsystems, displays, printers, and other peripherals— are covered by the applicable warranties for those products; HP software is covered by the HP Software Product Limited Warranty

FOR CONSUMER TRANSACTIONS IN AUSTRALIA AND NEW ZEALAND: THE WARRANTY TERMS CONTAINED IN THIS STATEMENT, EXCEPT TO THE EXTENT LAWFULLY PERMITTED, DO NOT EXCLUDE, RESTRICT OR MODIFY AND ARE IN ADDITION TO THE MANDATORY STATUTORY RIGHTS APPLICABLE TO THE SALE OF THIS PRODUCT TO YOU.

Three Year Limited Hardware Warranty

Hewlett-Packard (HP) warrants this hardware product against defects in materials and workmanship for a period of three years from receipt by the original end-user purchaser.

The three year warranty includes on-site service during the first year of use (free parts and labor), and parts service provided by an HP Service Center or a participating Authorized HP Personal Computer Dealer Repair Center, during the second and third years of use.

If HP receives notice of above defined defects during the warranty period, HP will either, at its option, repair or replace products, which prove to be defective.

Should HP be unable to repair or replace the product within a reasonable amount of time, the customer's alternate exclusive remedy shall be a refund of the purchase price upon return of the product.

The system processor unit, keyboard, mouse, and Hewlett-Packard accessories inside the system processor unit —such as video adapters, mass storage devices, and interface controllers— are covered by this warranty.

This warranty is extended worldwide under certain conditions (please check with your local HP office) to products purchased from HP or an Authorized HP Personal Computer Dealer which are reshipped by the original purchaser either for use by the original purchaser or provided as an incidental part of systems integrated by the original purchaser. When available in the country of use, service is provided in the same manner as if the product was purchased in that country and can only be provided in countries where the product is designed to operate. If the product is not normally sold by HP in the country of use, it must be returned to the country of purchase for service. Response time for on-site service, and parts delivery turnaround time for parts service, are subject to changes from standard conditions based upon non-local parts availability.

Limitation of Warranty

The above warranty shall not apply to defects resulting from: misuse; unauthorized modification; operation or storage outside the environmental specifications for the product; in-transit damage; improper maintenance; or defects resulting from use of non-HP software, accessories, media, supplies, consumables, or such items not designed for use with the product.

Reloading the bundled or pre-loaded software on your PC Workstation is not covered by the HP warranty.

HP MAKES NO OTHER EXPRESS WARRANTY, WHETHER WRITTEN OR ORAL, WITH RESPECT TO THIS PRODUCT. ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS IS LIMITED TO THE THREE-YEAR DURATION OF THIS WRITTEN WARRANTY. SOME STATES OR PROVINCES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

This warranty gives you specific legal rights, and you may also have other rights, which vary, from state to state, or province to province.

Limitation of Liability and Remedies

THE REMEDIES PROVIDED ABOVE ARE THE CUSTOMER'S SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT SHALL HP BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, WHETHER BASED ON WARRANTY, CONTRACT, TORT, OR ANY OTHER LEGAL THEORY.

The foregoing limitation of liability shall not apply in the event that any HP product sold hereunder is determined by a court of competent jurisdiction to be defective and to have directly caused bodily injury, death, or property damage; provided, that in no event shall HP's liability for property damage exceed the greater of \$50,000 or the purchase price of the specific product that caused such damage.

Some states or provinces do not allow the exclusion or limitation of incidental or consequential damages — including lost profit— so the above limitation or exclusion may not apply to you.

Obtaining On-Site Warranty Service

To obtain on-site warranty service, the customer must contact an HP Sales and Service Office (in the US, call the HP Customer Support Center at (303) 635-1000) or a participating Authorized HP Personal Computer Dealer Repair Center. The customer must be prepared to supply proof of the purchase date.

The system processor unit, keyboard, mouse, and Hewlett-Packard accessories inside the system processor unit —such as video adapters, mass storage devices, and interface controllers— are covered by this warranty.

During the on-site warranty period, customer-replaceable components may be serviced through expedited part shipment. In this event, HP will prepay shipping charges, duty, and taxes; provide telephone assistance on replacement of the component when necessary; and pay shipping charges, duty, and taxes for any part that HP asks to be returned.

On-site visits caused by non-Hewlett-Packard products —whether internal or external to the system processor unit— are subject to standard per-incident travel and labor charges.

On-site service for this product is restricted or unavailable in certain locations. In HP Excluded Travel Areas— areas where geographical obstacles, undeveloped roads, or unsuitable public transportation prohibit routine travel— service is provided on a negotiated basis at extra charge.

Response time for HP on-site service in an HP Service Travel Area is normally next business day (excluding HP holidays) for HP Travel Zones 1-3 (generally 100 miles or 160 Km from the HP office). Response time is second business day for Zones 4 and 5 (200 miles, 320 Km); third business day for Zone 6 (300 miles, 480 Km); and negotiated beyond Zone 6. Worldwide Customer Support Travel information is available from any HP Sales and Service Office.

Travel restrictions and response time for dealer or distributor service are defined by the participating dealer or distributor.

Service contracts which provide after-hour or weekend coverage, faster response time, or service in an Excluded Travel Area are often available from HP, an authorized dealer, or authorized distributor at additional charge.

Customer Responsibilities

The customer may be required to run HP-supplied diagnostic programs before an on-site visit or replacement part will be dispatched.

The customer is responsible for the security of its proprietary and confidential information and for maintaining a procedure external to the products for reconstruction of lost or altered files, data, or programs.

The customer must provide: access to the product; adequate working space and facilities within a reasonable distance of the product; access to and use of all information and facilities determined necessary by HP to service the product; and operating supplies and consumables such as the customer would use during normal operation.

A representative of the customer must be present at all times. The customer must state if the product is being used in an environment which poses a potential health hazard to repair personnel; HP or the servicing dealer may require that the product be maintained by customer personnel under direct HP or dealer supervision.

Obtaining Parts Warranty Service

When parts warranty service applies, the customer may be required to run HP-supplied diagnostic programs before a replacement part will be dispatched. The customer must be prepared to supply proof of purchase.

The customer shall return some defective parts upon HP demand. In that case, HP will prepay shipping charges for parts returned to the HP parts service center.

HP Telephone Support Services

HP Free telephone support for your PC Workstation is available during the first year from date of purchase. This service will also provide technical assistance with the basic configuration and setup of your Kayak PC Workstation and for the bundled or pre-loaded operating system.

Telephone support is available at the end of the first year from date of purchase, via the Lifeline program, which is a fee-based service (North America and Europe only).

HP does NOT provide telephone support for PC Workstations configured as network servers. We recommend HP NetServers for your network server requirements.

(Rev. 17/03/98)

HP Software Product License Agreement and Software Product Limited Warranty

Your HP Kayak PC Workstation contains preinstalled software programs. Please read the Software License Agreement before proceeding.

CAREFULLY READ THIS LICENSE AGREEMENT AND LIMITED WARRANTY STATEMENT BEFORE PROCEEDING TO OPERATE THIS EQUIPMENT. RIGHTS IN THE SOFTWARE ARE OFFERED ONLY ON THE CONDITION THAT THE CUSTOMER AGREES TO ALL TERMS AND CONDITIONS OF THE LICENSE AGREEMENT. PROCEEDING TO OPERATE THE EQUIPMENT INDICATES YOUR ACCEPTANCE OF THESE TERMS AND CONDITIONS. IF YOU DO NOT AGREE WITH THE TERMS OF THE LICENSE AGREEMENT, YOU MUST NOW EITHER REMOVE THE SOFTWARE FROM YOUR HARD DISK DRIVE AND DESTROY THE MASTER DISKETTES, OR RETURN THE COMPLETE COMPUTER AND SOFTWARE FOR A FULL REFUND. PROCEEDING WITH CONFIGURATION SIGNIFIES YOUR ACCEPTANCE OF THE LICENSE TERMS.

HP Software Product License Agreement

UNLESS OTHERWISE STATED BELOW, THIS HP SOFTWARE PRODUCT LICENSE AGREEMENT SHALL GOVERN THE USE OF ALL SOFTWARE THAT IS PROVIDED TO YOU, THE CUSTOMER, AS PART OF THE HP COMPUTER PRODUCT. IT SHALL SUPERSEDE ANY NON-HP SOFTWARE LICENSE TERMS THAT MAY BE FOUND ON-LINE, OR IN ANY DOCUMENTATION OR OTHER MATERIALS CONTAINED IN THE COMPUTER PRODUCT PACKAGING.

Note: Operating System Software by Microsoft is licensed to you under the Microsoft End User License Agreement (EULA) contained in the Microsoft documentation.

The following License Terms govern the use of the software:

USE. Customer may use the software on any one computer. Customer may not network the software or otherwise use it on more than one computer. Customer may not reverse assemble or decompile the software unless authorized by law.

COPIES AND ADAPTATIONS. Customer may make copies or adaptations of the software (a) for archival purposes or (b) when copying or adaptation is an essential step in the use of the software with a computer so long as the copies and adaptations are used in no other manner.

OWNERSHIP. Customer agrees that he/she does not have any title or ownership of the software, other than ownership of the physical media. Customer acknowledges and agrees that the software is copyrighted and protected under the copyright laws. Customer acknowledges and agrees that the software may have been developed by a third party software supplier named in the copyright notices included with the software, who shall be authorized to hold the Customer responsible for any copyright infringement or violation of this Agreement.

PRODUCT RECOVERY CD-ROM. If your computer was shipped with a product recovery CD-ROM: (i) The product recovery CD-ROM and/or support utility software may only be used for restoring the hard disk of the HP computer with which the product recovery CD-ROM was originally provided. (ii) The use of any operating system software by Microsoft contained in any such product recovery CD-ROM shall be governed by the Microsoft End User License Agreement (EULA).

TRANSFER OF RIGHTS IN SOFTWARE. Customer may transfer rights in the software to a third party only as part of the transfer of all rights and only if Customer obtains the prior agreement of the third party to be bound by the terms of this License Agreement. Upon such a transfer, Customer agrees that his/her rights in the software are terminated and that he/she will either destroy his/her copies and adaptations or deliver them to the third party.

SUBLICENSING AND DISTRIBUTION. Customer may not lease, sublicense the software or distribute copies or adaptations of the software to the public in physical media or by telecommunication without the prior written consent of Hewlett-Packard.

TERMINATION. Hewlett-Packard may terminate this software license for failure to comply with any of these terms provided Hewlett-Packard has requested Customer to cure the failure and Customer has failed to do so within thirty (30) days of such notice.

UPDATES AND UPGRADES. Customer agrees that the software does not include updates and upgrades which may be available from Hewlett-Packard under a separate support agreement.

EXPORT CLAUSE. Customer agrees not to export or re-export the software or any copy or adaptation in violation of the U.S. Export Administration regulations or other applicable regulation.

U.S. GOVERNMENT RESTRICTED RIGHTS. Use, duplication, or disclosure by the U.S. Government is subject to restrictions as set forth in subparagraph (c) (1) (ii) of the Rights in Technical Data and Computer Software clause in DFARS 252.227-7013. Hewlett-Packard Company, 3000 Hanover Street, Palo Alto, CA94304 U.S.A. Rights for non-DOD U.S. Government Departments and Agencies are as set forth in FAR 52.227-19(c) (1,2).

HP Software Product Limited Warranty

THIS HP SOFTWARE PRODUCT LIMITED WARRANTY SHALL COVER ALL SOFTWARE THAT IS PROVIDED TO YOU, THE CUSTOMER, AS PART OF THE HP COMPUTER PRODUCT, INCLUDING ANY OPERATING SYSTEM SOFTWARE. IT SHALL SUPERSEDE ANY NON-HP WARRANTY TERMS THAT MAY BE FOUND ON-LINE, OR IN ANY DOCUMENTATION OR OTHER MATERIALS CONTAINED IN THE COMPUTER PRODUCT PACKAGING.

Ninety-Day Limited Software Warranty. HP warrants for a period of NINETY (90) DAYS from the date of the purchase that the software product will execute its programming instructions when all files are properly installed. HP does not warrant that the software will be uninterrupted or error free. In the event that this software product fails to execute its programming instructions during the warranty period, Customer's remedy shall be a refund or repair. Should HP be unable to replace the media within a reasonable amount of time, Customer's alternate remedy shall be a refund of the purchase price upon return of the product and all copies.

Removable Media (If supplied). HP warrants the removable media, if supplied, upon which this product is recorded to be free from defects in materials and workmanship under normal use for a period of NINETY (90) DAYS from the date of purchase. In the event the media proves to be defective during the warranty period, Customer's remedy shall be to return the media to HP for replacement. Should HP be unable to replace the media within a reasonable amount of time, Customer's alternate remedy shall be a refund of the purchase price upon return of the product and destruction of all other non removable media copies of the software product.

Notice of Warranty Claims. Customer must notify HP in writing of any warranty claim not later than thirty (30) days after the expiration of the warranty period.

Limitation of Warranty. HP makes no other express warranty, whether written or oral with respect to this product. Any implied warranty of merchantability or fitness for a particular purpose is limited to the 90-day duration of this written warranty. Some states or provinces do not allow limitations on how long an implied warranty lasts, so the above limitation or exclusion may not apply to you. This warranty gives specific legal rights, and you may also have other rights which vary from state to state, or province to province.

Limitation of Liability and Remedies. THE REMEDIES PROVIDED ABOVE ARE CUSTOMER'S SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT SHALL HP BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOST PROFIT) WHETHER BASED ON WARRANTY, CONTRACT, TORT OR ANY OTHER LEGAL THEORY. Some states or provinces do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

Obtaining Warranty Service. Warranty service may be obtained from the nearest HP sales office or other location indicated in the owner's manual or service booklet.

Consumer transactions in Australia and the United Kingdom: The disclaimers and limitations above shall not apply and shall not affect the statutory rights of a Consumer.

(Rev. 19/11/96)



Your HP PC Workstation's Physical Characteristics

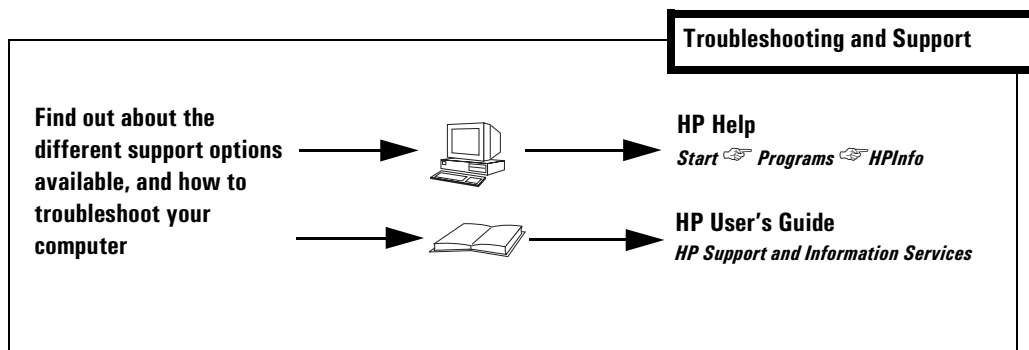
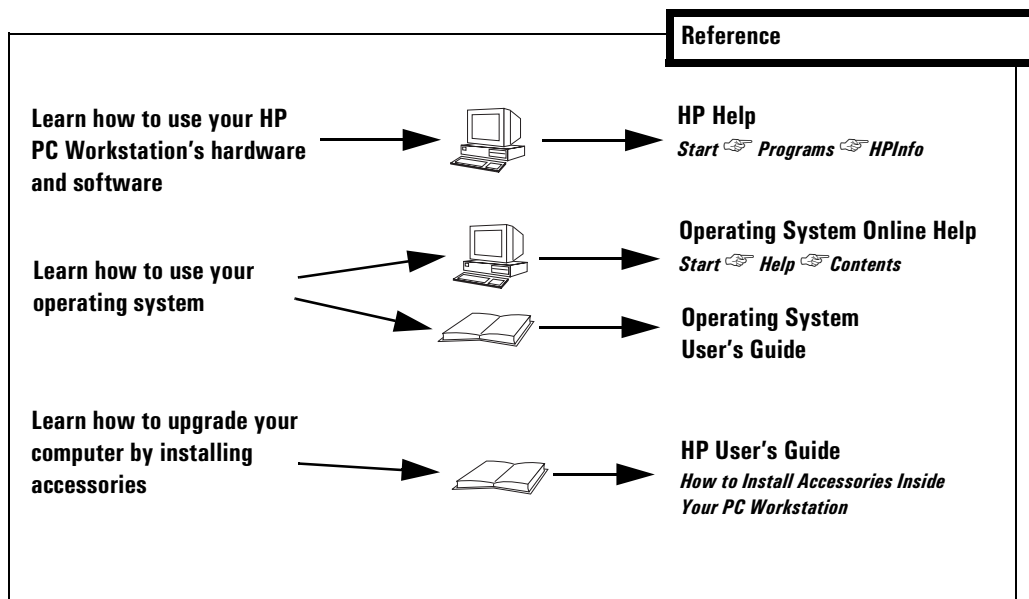
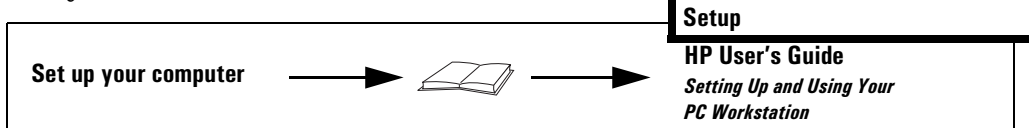
Characteristics:	Description:
Weight (excl. keyboard and display)	17.1 kilograms (37.6 pounds).
Dimensions	41.1 cm (max.) (D) by 21 cm (W) by 41.4 cm (H) (16.18 inches (max) by 8.27 inches by 16.30 inches).
Footprint	0.09 m ² (0.95 sq ft).
Storage temperature	-40 °C to 70°C (-40 °F to 158 °F).
Storage humidity	8% to 80% (relative).
Operating temperature	5 °C to 40 °C (40 °F to 104 °F).
Operating humidity	15% to 80% (relative).
Acoustic noise emission: Sound Power — with 10 krpm SCSI hard disk drive	(as defined ISO 7779) LwA < = 47.7 dB
Power supply	<ul style="list-style-type: none">● Input voltage: 100 - 127, 200 - 240 Vac (selected automatically)● Input frequency: 50/60Hz● Maximum power: 260 W continuous





PC Workstation Documentation Roadmap

If you want to ...



Paper not bleached with chlorine

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Printed in EU - 03/98



D5699-90001